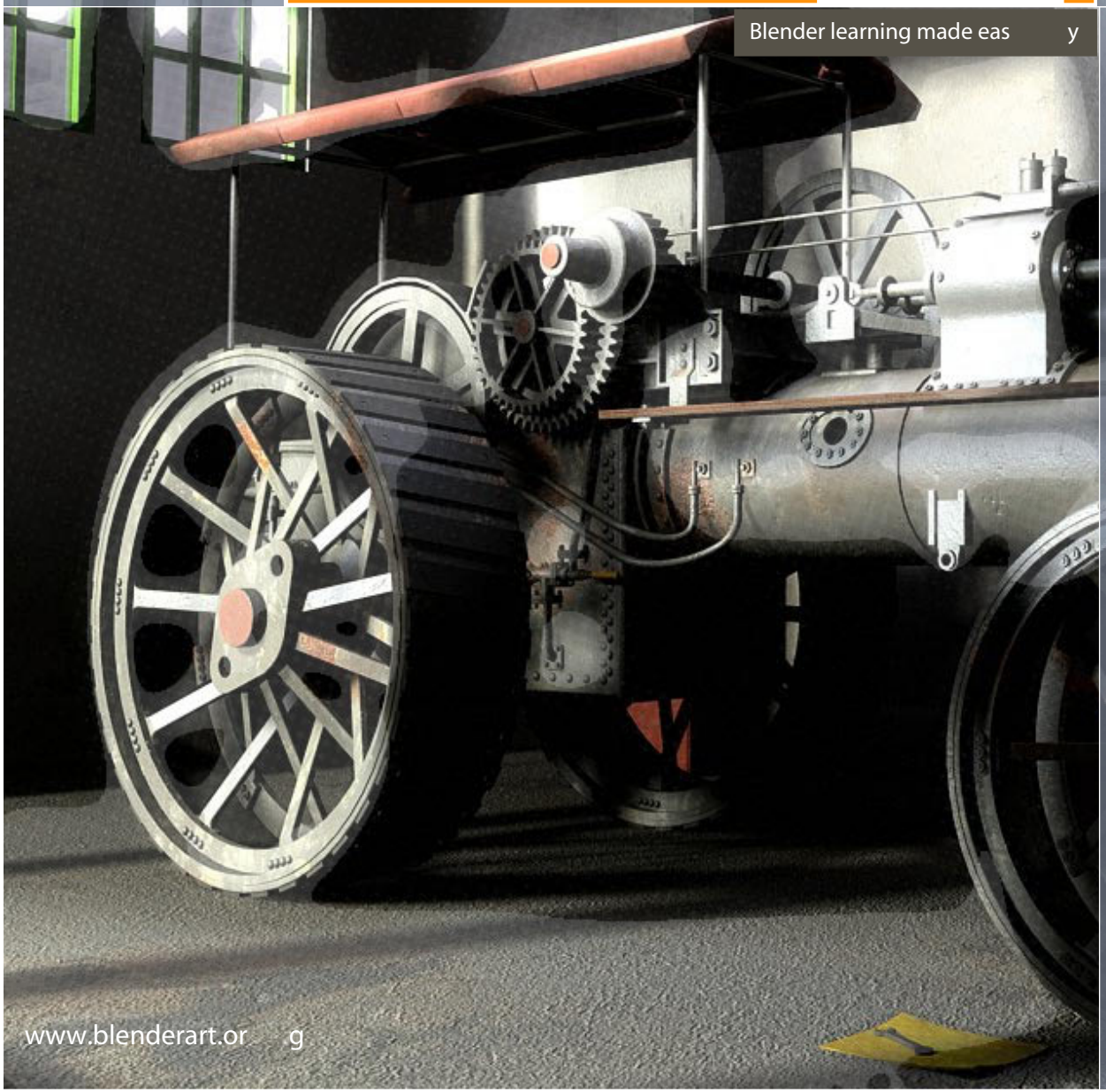
Issue1 | Nov 2005

blender art MAGAZINE

Blender learning made eas y



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MECHANICAL MODELING

Special: Blender Mechanical Gears

TUTORIALS

Modeling a robot
Plane line intersection
Texturing [robot]
Animating [robot]

NEWS FLASH

GIMP 2.34
Blender 2.40
Blender Conferences

GALLERY

blender art MAGAZINE

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Sandra Gilbert

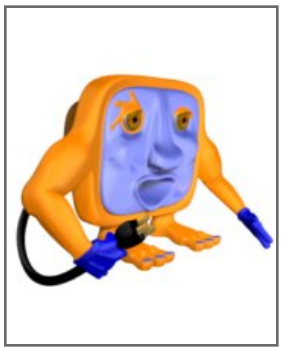
Five years ago I went looking for a 3D program. I found blender, friends and a new way of looking at the world around me. During this time, one of my favorite blender related activities has been browsing online for all the latest blender news, new features, tutorials and techniques. Over the last five years I have used literally cases of paper, printing out everything available on blender. I still remember how I (and many others) eagerly waited for each new issue of the "Community Journal". It was something cool to look forward to. And something I still miss.

Which brings us to the point of this editorial. Gaurav and I decided that we didn't have anywhere near enough things to do with our non-existent free time, so we decided to launch the latest re-incarnation of a blender magazine. And this is it, Blenderart. Welcome to our mission to provide news, tutorials and blender related information in an attractive, fun to read format.

A place to find out all the latest news concerning blender. We will be bringing you tutorials covering new features, and seldom used/obscure features. We will take a look at new ways of doing things and cover how to accomplish basic to advanced projects. Tutorials in each issue will cover a general theme, pulling together a complete project, giving you that extra little push to try something new.

In this issue we are going to tackle modeling, texturing and rigging a robot for basic animation. Keeping in line with our theme, Stefano shares his techniques on modeling and animating gears, with a short tutorial on using the Blender Mechanical Gears (BMG) script. And Alvaro Luna Bautista shows us how to calculate a plane line intersection. We also have a small gallery of mechanical images submitted from community members.

We hope you enjoy our first issue and welcome you to submit article, tutorials and artwork for future editions.



Well, since I haven’t received any questions yet, I thought I would kick off our first issue with some little known/obscure blender tips.

1. **Animation Preview in all windows at the same time:** It is well known that Alt-A is for previewing an animation on the 3D window. But that's not all of it. Divide your screen into multiple 3D Windows, each from a different point of view.

If you have an Action/Ipo Window and 3D windows open, and you issue the **[Alt-Shift-A]** command from the Action (or the Ipo) window, it will animate both (the action and the 3D) in sync!! Great for visualization of Ipo's effect on your model.

2. **"Truck" the camera in camera mode:**
a) go into cam mode with NUMPAD 0
b) move the camera with pressing Gkey
c) press the middle mouse button

3. **Hidden Objects:**
I don't know how old this is (or whether it's been mentioned before) ... but I just discovered it. Say you are in front or side view and you want to select an object, but it is hidden behind other objects. If you press Alt RMB over a group of objects, a menu will be displayed in the 3D window allowing you to pick the object you wish to select.

4. **Show alpha texture as wire:**
ctrl-d in 3dview can show alpha texture as wire. very useful for preview without rendering.

If you have an object (works best on a mesh plane) with an image texture, you can use **[Alt-V]** outside editmode. This will adjust the object's size values so that the image won't be stretched when projected•

These are just a few tips I found browsing blender forums. If you have a cool blender tip or technique you would like to share or a question you would like answered, submit it to:

manager_blenderart@yahoo.com.

Until next time
Blentuu

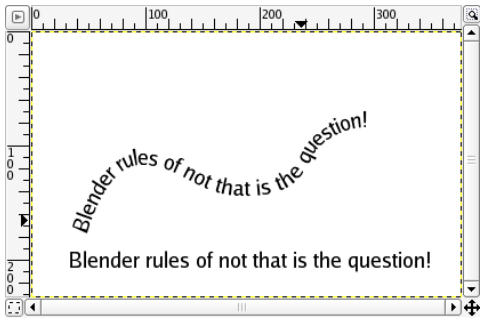
GIMP 2.34

"Close to the release date of Blender2.4 we might see the release of Gimp2.4 too."

Let 's take a look and find whats in the store. First of all the major feature that will make in to the 2.4 release are the ICC colour profiles support in the image formats that support it, like tiff and jpg. While its nice to have the porfilce support at last but again it misses out on not having the CMYK colourspace to be used with it. This makes the ICC profile support a bit offcolour. None the less its a pretty useful tool for those who use SCRIBUS for the DTP work. We found good use of ICC support in producing this magazine in SCRIBUS.

SIOX a prototype of new forground extraction tool in gimp which works interactively, it not complete yet but worked fine in the Gimp2.33 (test version) itself.

Cleanup of scriptfu and python fu filters. These filters/scripts are now placed nicely inside the main 'Filters' menu itself, this reduces a lot of confusion for amateur users..



Text Tool Finally GIMP has even more elementary support added in the text tool, you can now make the text follow any path, and this all is done in vectors so there will be no blurring of the text in the process. Infact a new path layer for the followed path is created so now you can make use of the path by the options availabe for path like stroking copying selection or even modifying the path itself.

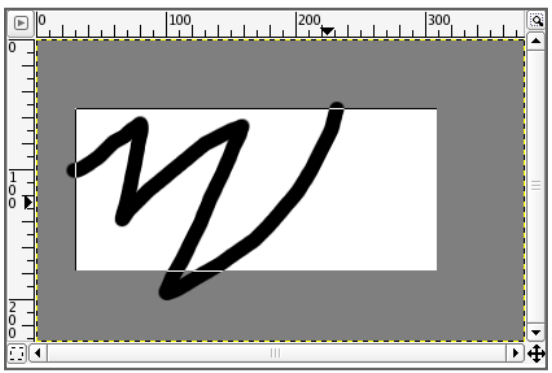
Apart for these more visible features there is addition of two more tools in the main tool box first is 'rectangular selection' it looks much like old one but this have some better features like you are allowed to actively manipulate the size of selection through the mouse like moving or increasing the shape, clicking inside or outside the box will make it into the selection.

New entries in the toolbox

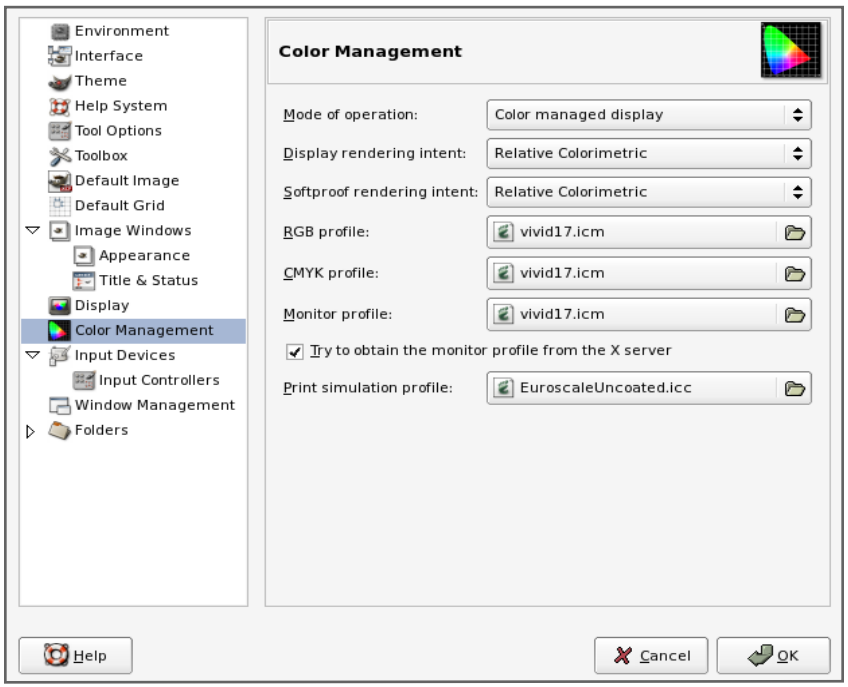
GIMP 2.34

There are some improvements in the interface again in compliance for the GIH (Gnome Human Interface guidelines). But what is even more interesting is that this time around we might see a great deal of menu overhauling as the Gimp project has just now asked for UI designers/ engineers, evidently this feature becomes more pronounced since there are many old Photoshopers complaining about the 'different' interface now a days.

I nearly forgot to mention one more important feature, it is introduction of new 'Lanczos' sampling algorthim used in scaling of images. It is known to be of higher quality than the older bicubiic sampeling.



New Selection box in action.



Colour management preferences

In the end It can be saftely said that the upcomming Gimp release will be really exciting in terms of sheer number of feature additions and improvemets.

Blender News

The last several months, and more specifically the last several weeks have seen a rush of new features being added to blender. Due in a large part to requests by Project Orange, the animation system has been significantly improved with new features and tools thereby shrinking the project 'wish list' (http://orange.blender.org/blog/the-ever-shrinking-orange-wishlist) and giving us a vastly improved work flow.

And while the animation system has gotten a major overhaul, other areas of blender were not ignored. Modifier Stacks, Mesh Subdivide Tools, Radial Blend Type, Fluid Simulation, Hair strand rendering and Mesh Ripping have all made their way into recent test builds. Additionally the Summer of Code projects are in the final stages of being added to the code.

And these were just the major changes, there has been no end of code clean-ups, minor and sometimes major fixes of existing tools. Version 2.40 looks to be a major upgrade. For full details on the latest features and additions, go to:
http://www.blender.org/cms/Blender_2_40_alpha.598.0.html

And drop by the testing forums to pick up a current build with all the new features. The more of us that test the builds out, the sooner bugs can be reported back to the coders and fixed.

Conference News

October saw both the Amsterdam and Montreal annual blender conferences. Reports from attendees say all had a good time, with useful and productive presentations filling the day, and fun filled interaction in the evenings. Pictures and videos of both conferences are already being prepared and posted online for those of us unable to attend.

Ton has posted an article outlining briefly topics of interest for the coming year. High on the list is education and training development. A topic of great interest to many of us. For his full article, go to:
http://www.blender.org/cms/Newsitem.607+M55216e564b2.0.html

For videos/slide shows of the Amsterdam conference, go to: http://www.blender.org/cms/2005_Videos.714.0.html

The videos from the Montreal conference aren't quite ready yet, but keep an eye out at the elysiun forums, where news will be posted when they are ready.

New Yafray?

Recent news from the Yafray camp suggests that Yafray is also going to be completely revamped, that means it will be coded from scratch. Importantly it will be using physicially more accurate algorthim for raytracing, in simple terms it means we can expect it to be of even higher quality like Maxwell renderer, hopefully the issue of speed up in rendering will also be addressed in this revision along with lots of new features.

Modeling a robot in blender

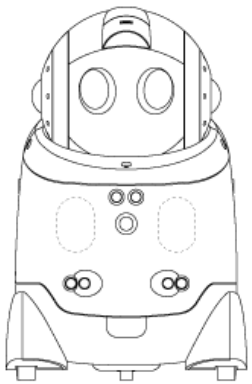
Level: Beginner to intermediate

Introduction
3D modeling is one of the most interesting parts of the CG, but it provides quite a challenge for a beginner to the 3D modeling. In this tutorial we will take you through various techniques involved in modeling an simple looking robot in Blender. This particular robot is called 'papero' and its a companion bot produced by 'NEC' Corporation Japan.

Please note that this article is not made for any commercial gains and neither is allowed to be distributed or used for commercial gains. It is not affiliated to NEC in any way. The NEC robot referenced here is purely for educational purpose only.

The best approach to learn from this tutorial is also to consult the blender manual where ever you find it necessary, especially if you are very new to blender then learn about the various naming conventions like view-port, 'edit mode', vertex, 'transformer gizmo' etc. In this tutorial care has been taken to provide these features as the heading of the steps, so that if we say add a cube you can reference on how to add an object step learned previously. Reading it once is recommended for all new users to the 3D world of Blender even if you are not able to follow it properly.

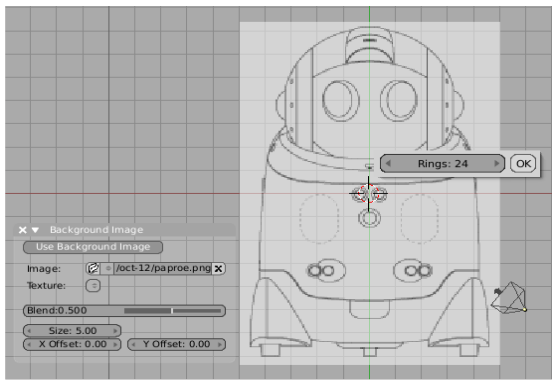
Starting up
First of all make a search on goggle for 'papero' or 'NEC robots' for reference images. Try to figure out how the model looks from different views. There are few different versions available but we are going to make a generic body. It would be helpful if you can get image1 from the net, if thats not possible it is also provided in the sample blend file for this tutorial.



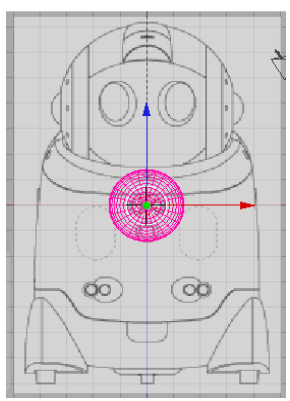
Modeling the head PART-1

Step 1. *Adding a image to the view port:* Start up Blender. First thing you need to do is delete the default cube. Right click on it to select it, if its not already, then press [Del] and confirm deletion in the popup. Now we will add an reference image of the robot in the view port. Press [NumPad 1] for front view in the view-port, now go to 'View |Background Image...' menu of the view-port. In the popup click on the 'folder' icon and navigate to the reference image, select it and press Enter.

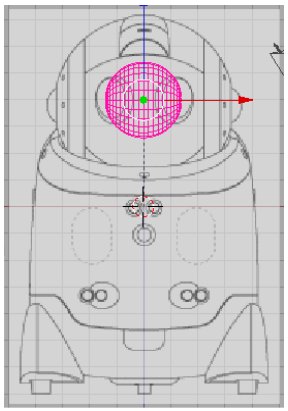
Step 2. *Adding primitives*: Now we will start modeling, we will first start with modeling the face. Keep the mouse in the view-port and press [Spacebar] In the popup menu go to Add |Mesh | UVsphere. Again in the new popup reduce the number of vertices to 24 and again 24 in another popup then press OK to add the sphere.



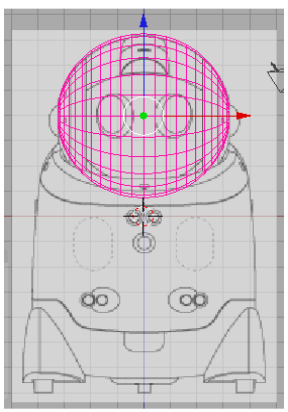
Step 3. *Working modes:* Note that the sphere is added at the place where the insertion cursor(red white striped circle) is and the center of the circle is represented with a pink dot. Also you will notice that the object added is in 'edit mode'. You can toggle the 'edit mode' to 'object mode' by pressing [Tab] key once. Do it now.



Step 4. *Moving Objects*: Now to position the sphere in 'object mode' to the head part as seen in the reference image in back. To do that, move your mouse over to blue arrowhead, click and keep pressed the button and move the mouse upwards. The sphere object will move upwards, keep pressing [Ctrl] Key to make big grid jumps. Use [Shift] in combination for minor grid jumps. Position the sphere as seen in the image.



Step 5. *Scaling Objects:* To scale any object in 'edit mode' or 'object mode' you first have to select the object or its parts. Since the sphere is already selected. Press [S] key and any mouse movement towards the object center will result in scaling down of object and inversely any movement away from object center will result in scaling up of the size. Here scale up the size of sphere as shown in image following the reference in the back. Note again, you can compliment the scaling operation with [Ctrl] or [Shift] or combination of both for better control.

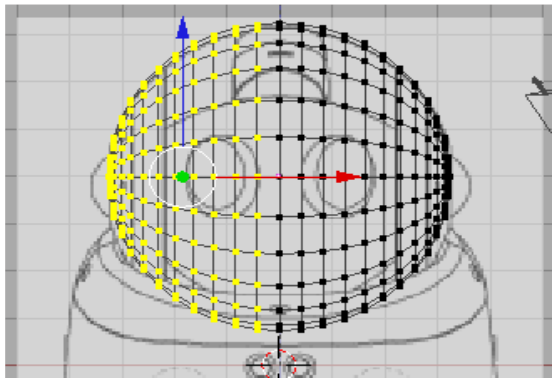


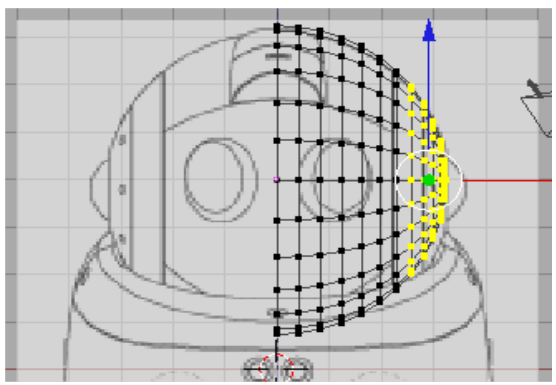
Step 6. *Selecting vertices:* Up to now you were working in 'object mode'. Keep selected the sphere and press [Tab] to get into the 'edit mode'. 'Edit mode' is the core of working on a 3dmodel, so learn and observe carefully. Now we will learn to select vertices. You can do various types of selection in blender. To select or deselect all vertices use [A] key to toggle. Press [A] til all vertices turn black(deselected). Now press [B] (box select) and move your mouse cursor to the top left part of the vertices in sphere click and drag down so as to select the left part as shown in the image.

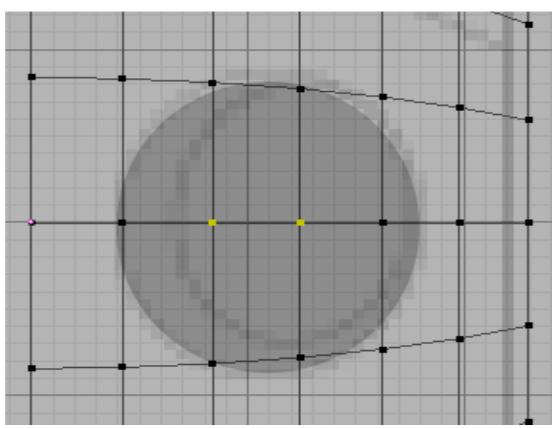
Step 7. *Deleting vertices:* Now we will delete the selected vertices. To do that, press either [Del] or [X] key and in the popup, select 'vertices'. As now you can see the selected vertices are all gone. We did that because the robot head is symmetric in appearance, so we need to just work on one half and later mirror it to get the complete head. Now as you can see in the image, we have also selected the ear part of the same sphere. Yes we will delete them too. Do it the same way as explained just now.

CREATING THE EYE PIECE

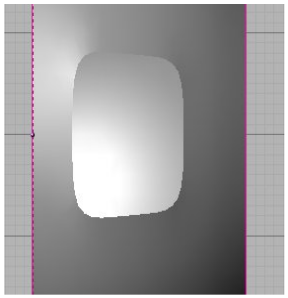
Step 8. *Zooming in the view-port:* To zoom in the view-port you can use 'scroll wheel' or [NumPad +] [NumPad -]. Now press [Z] key to toggle to shaded view mode from wire fame mode. Now as in the image, select the two vertices by keeping pressed [Shift] key and right clicking on the individual vertices, select as shown in the image and then delete the two vertices to create the eye hole for the robot head.



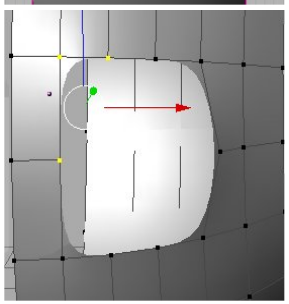




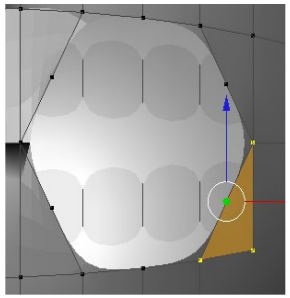
Step 9. *Using Subsurface:* Subsurface is the most important tool in 3d Mesh modeling. To enable Subsurface on the mesh, press [F9] and in the mesh tab in the buttons window (below the view-port) Click the 'SubSurf' button, also the optimal button and increase the divisions to 2, see image.



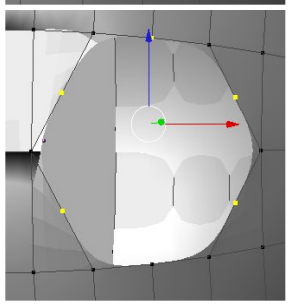
Step 10. *Creating a face from vertices:* Select the vertices as shown in the image10 and press [F] key once to make a face out of selected vertices. Now repeat it for other vertices on the hole as shown in the image11.



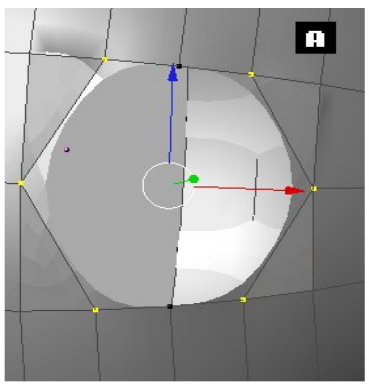
Step 12. *Merging faces:* Triangular vertices faces are bad for a smooth surface so we need to convert the two triangular faces to a single four vertices face. To do that select all four vertices of any of three vertices faces. Watch image 12 for example. Now go to 'Mesh |Faces |Convert triangles to quads' in the view-port menu. And the triangular face gets converted into a four sided face.

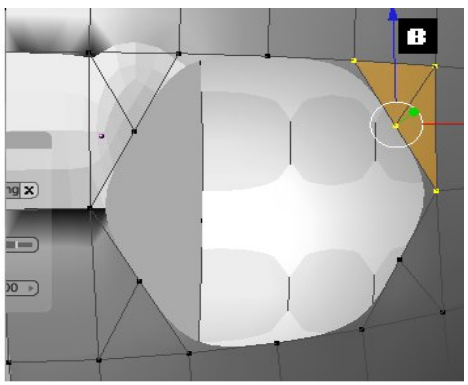


Step 13. *Scaling the vertices:* now select the vertices as shown in the image13 and scale them up a little bit so the shape of the eye hole looks like a circle. Here try to move the outer vertices of the eye in a straight line, use various methods of selection that you have learned earlier.

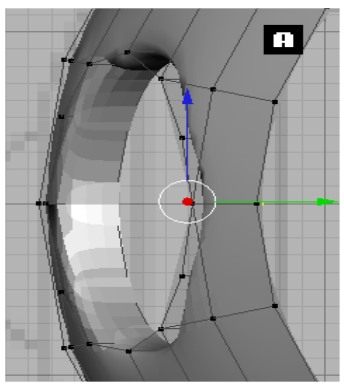


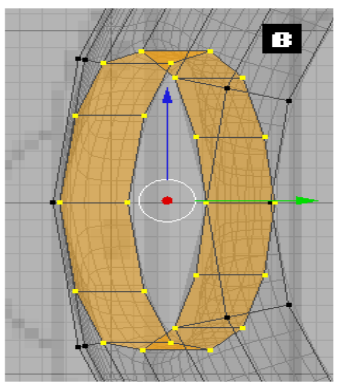
Step 11. *Subdividing an edge:* Select the two vertices which are inside the hole for the robot eye. Press [W] Key and select 'Subdivide' , as soon as you select it the face gets divided into two faces. Image12. Repeat the steps with other newly created faces.



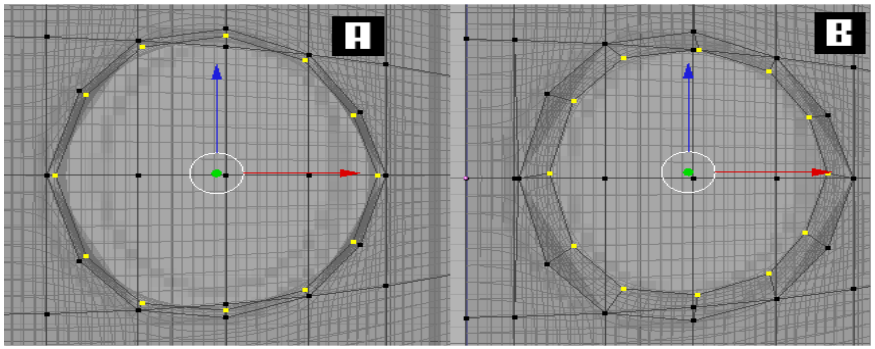


Step 14. *Extruding the faces:* Get in to 'Side view' by pressing [NumPad 3] and select all the vertices of the eye that form a circle. Press [E] to extrude the selected vertices and start moving the extrusion in the direction of green axis of the transformer gizmo as seen in the image 14 (a) and (b).



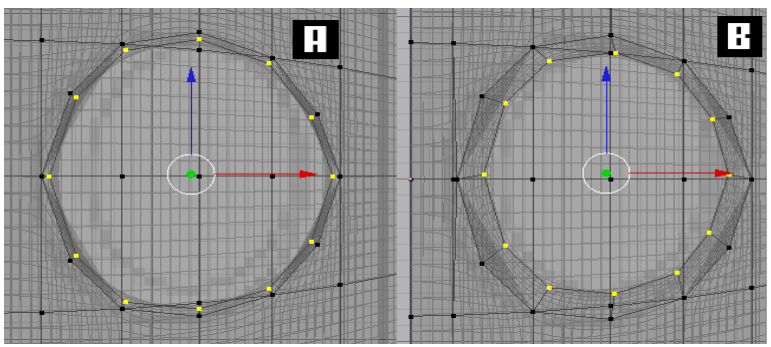


Step 15. Keep the last selection, now press [NumPad 1] to change back to the front view. Here once more press [E] to extrude and immediately press [S] to scale down the extrusion a little. image15.

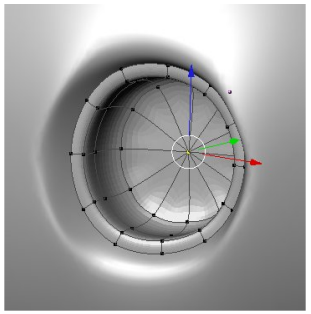


Duplicating the vertices: To make a copy of the selected vertices/faces you can press [Shift +D]. Continued from the last selection press [Shift +D] and immediately press [P] (to separate it from the mesh into another object) click "selected" in the popup. Now you can press [Tab] to get out of the 'edit mode' to 'object mode'. Right click to select the new circular mesh and press [Tab] to enter 'edit mode' for it.

Step 16. Now we need to create the tube like section for the eye. Select all the vertices [E] extrude them down a little (image 16a) Now get in to 'side view' [NumPad 3] and extrude the selected vertices towards green axis twice as seen in the image 16b.

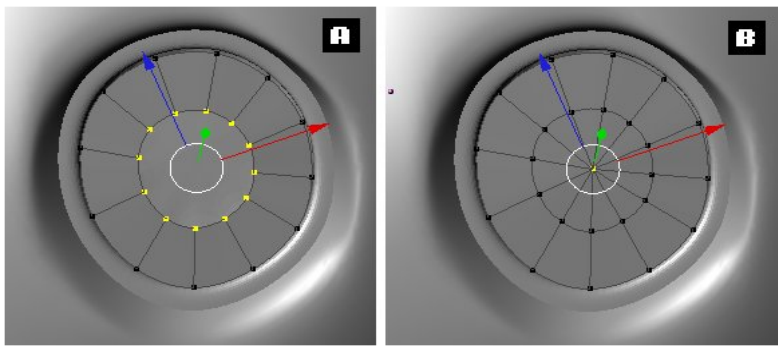


Step 17. *Welding the vertices:* Welding or merging vertices gives us a closed face which we want for the back of the eye piece to be like. Now again press [E] and immediately 'right click' to leave the transform state. Now press [Alt + M] in the popup select 'at cursor' and you can see the duplicate vertices get removed and they all form a face as seen in image 17.



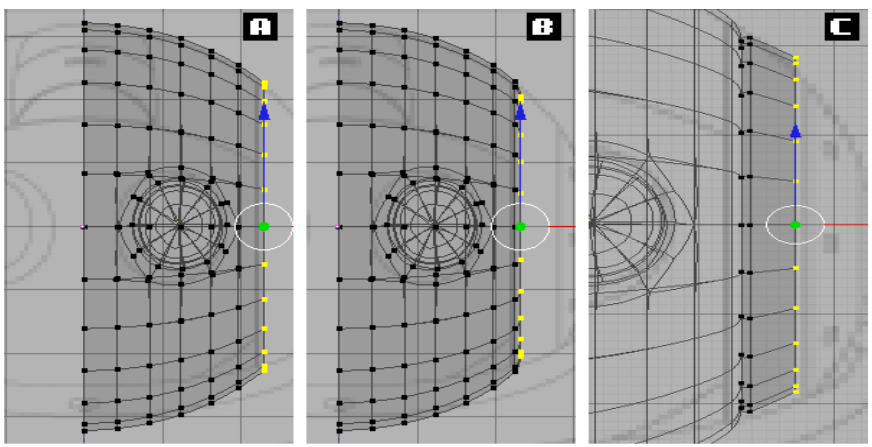
Loop selection: Now we need to create a eye cover glass for the eye piece. select the second loop of vertices from the eye piece. Press [Alt + B] and hover your mouse over the second circular loop in the image 18. The active selection will show a blue loop forming on it as soon as it does left click once to select the loop. Duplicate it and separate from this mesh. Get out of edit mode [Tab] now select the newly created mesh and press [Tab] to get into edit mode.

Step 18. Following the image 20 extrude once and scale it down (image 20a) Then extrude it again , immediately right click. Then press [Alt +M] to join the vertices and complete the face for the eye cover glass. Get out of 'edit mode'.

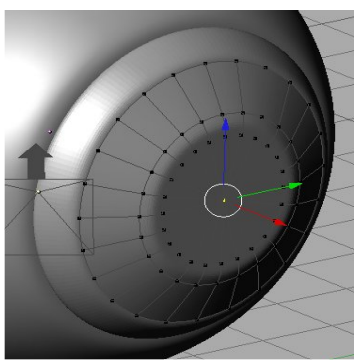


PART-2 CREATING THE EAR & MIRRORING THE HEAD
You have noticed that many times we have duplicated a mesh part to start working on another part of the model. This is done for two reasons firstly the duplicated mesh we get fits closely to the part of the model where we picked it from and secondly it saves a lot of time ;)

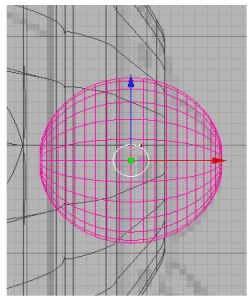
Step 1. Inner Ear: Again we will use duplicating method to make the ear piece. First select the head mesh get into 'edit mode' do one extrusion to very small distance towards red axis (image 19b) and duplicate it by [Shift +D]. Now get out of 'edit mode' and select the newly created mesh. Again get into 'edit mode' [Tab] and do three extrusion in red axis as seen in the image 19c.
Finally create one more extrusion and scale it down a little. Create a duplicate[Shift +D] from current selection and separate [P] it from the mesh.

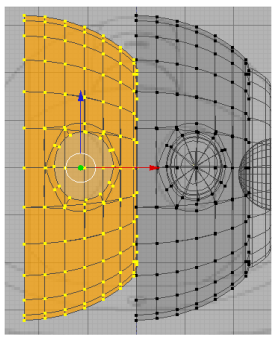


Step 2. Outer ear part: Exit the edit mode and select the mesh just created. As seen in the image 20 extrude it three times and once more right click and weld the selected vertices [Alt +M].



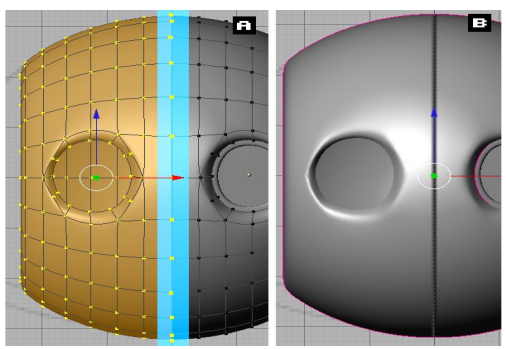
Step 3. Once again get out of the 'edit mode' and add a sphere of 16x16 ([Space Bar] 'Add |Mesh |UVsphere') in the middle of the ear as shown in the image 21. make sure that you position if right. Check the position in 'front view' and 'side view' see Image 21.





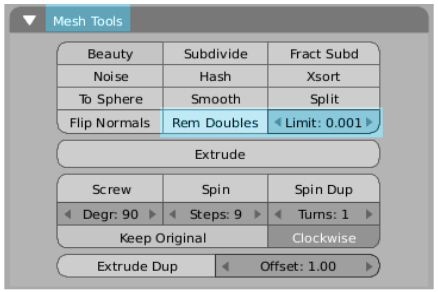
Step 4. *Mirroring a mesh:* Now the head is almost complete. Since the head is completely symmetric, we can go ahead and mirror it to get a completed head mesh. To do that select the 'head mesh' and make sure that you are in the 'front view' now press [Tab] to get into the 'edit mode'. Press [A] key til all the vertices are selected. Now press [Shift +D] to duplicate the selected mesh. Immediately right click to cancel any transformation. Now press [M] to bring up the mirror menu popup. here choose 'X Global'. You will see the selected mesh is mirrored.

Step 5. *Merging the mirrored surfaces:*. Now using the 'transformer gizmo' of the x axis (red) bring the two meshes closer so that the near edges are overlapping each other watch the image 23a for the highlighted part.

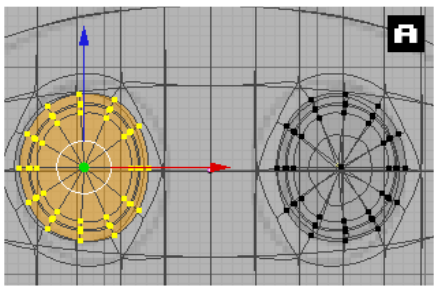


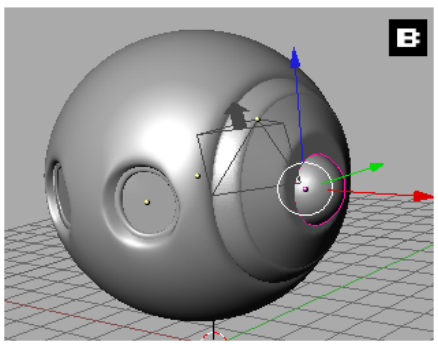
At this point you can zoom in and make sure that those edges are 'correctly overlapping each other. Now deselect all other vertices and make a box selection [B] around the highlighted part as seen in image 32a.

Now get out of the 'edit mode' and as soon as you get out of the edit mode you might see a black line in the middle of the head mesh as seen in image 23b. Again get in to 'edit mode' select all vertices and press [Ctrl + N] (calculate normals). Now the mesh will look smooth and you have created the head of the robot.



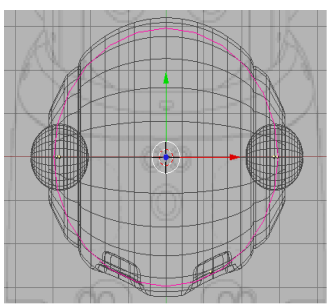
Step 6: Creating the rest of the head parts. Now following the procedure of duplicating and mirroring go ahead and do the same for the 'eye piece' (image 25a) eye glass' and the 'ear ball'. After you have done that the final model should look some thing like in the image25b.



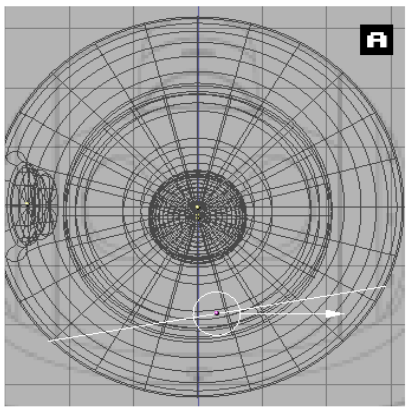


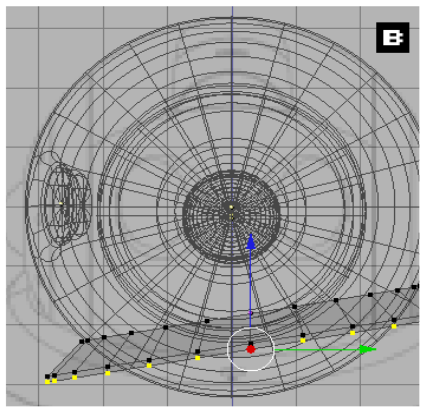
PART-3
UPPER & LOWER BODY

Step 1. Make sure you are in 'Object mode'. Go to 'top view' [NumPad 7} and add a UVsphere [Space bar] 'Add |Mesh | Circle ' of 24 vertices (image 26). Get out of the 'edit mode' and change the view mode to 'side view' [NumPad 3]. First position the circle just below the 'ear part'.

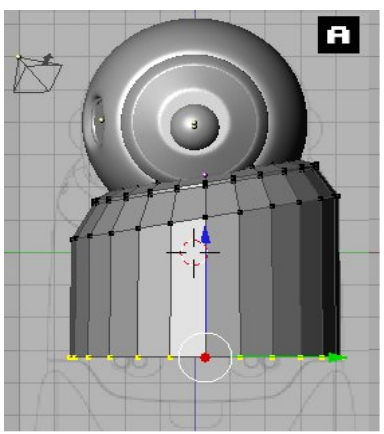


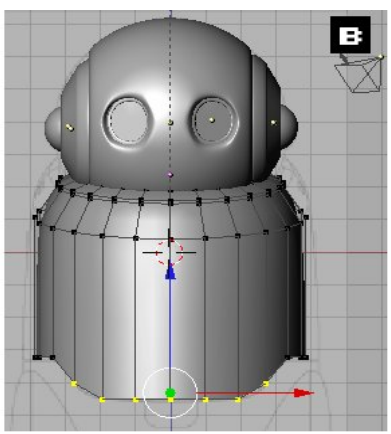
Step 2. *Rotating the objects:* Press [R] key to rotate the circle as shown in the image 27a. Get into 'edit mode' and extrude once downwards on the Z axis (blue) and scale it as shown in the image 27b. Following the image extrude once more.



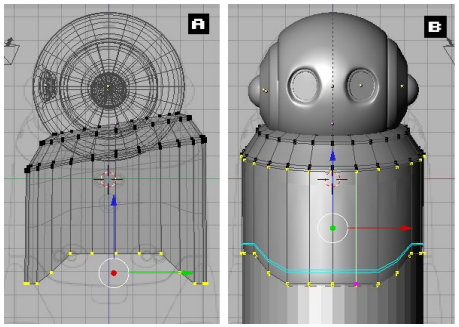


Step 3. Extrude once more following the image 28a. Now we need to make out the body design as seen in the reference images. To do that get in to the 'front view' [NumPad 1] and box [B] select the vertices as shown in the image. [G] grab the vertices and immediately press [Z] and pull them down as shown in the image 28b and 29a.

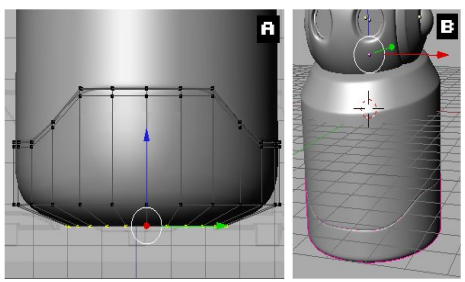




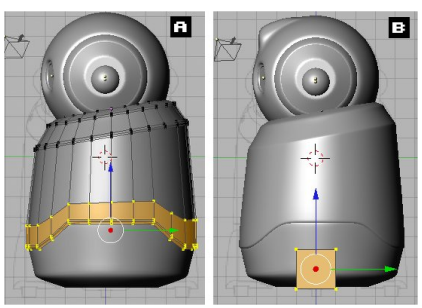
Step 4. *Adding a loop of vertices:* At this point we need to extrude vertices once and then scale them down so that we get a smooth bend edge for the body. But you will notice that the body looks a bit pulpy so we will add a new loop of vertices just near the bottom part (image 29b) to make it look like a solid surface with defined edges. To add a edge loop press [Ctrl + R] the cursor will now change in to a blue lop line and will follow the position of the mouse, bring it down and near to the bottom part as seen in image 29b and click to add the loop.



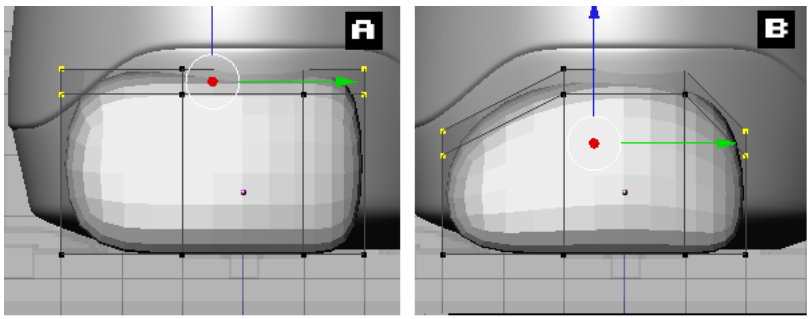
Step 5. Lower body: Make a duplicate [Shift +D] of the same selection and separate it from the mesh. We will use it to make the lower body. Get out of the 'edit mode'[Tab] and select the newly created mesh and again get into 'edit mode' [Tab]. Now extrude once and scale it a little. Again extrude and bring the extrusion down a little. Extrude and bring it down as seen in image and here move the vertices in the same line. Now extrude twice following the image 30a and weld[Alt +M] the last extrusion.



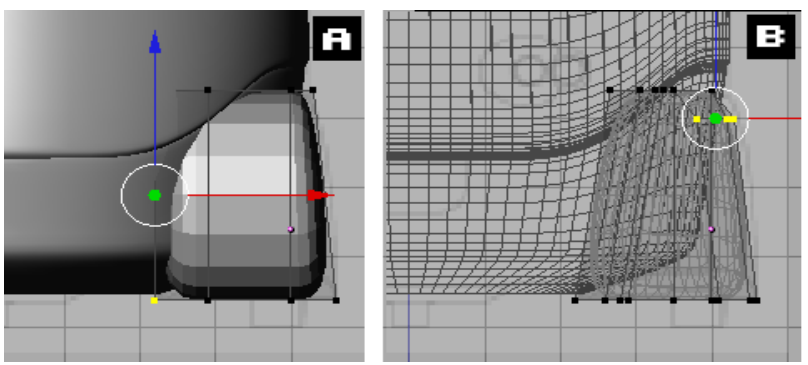
Step 6. Get in to the 'side view' and scale the lower part of the 'upper body' and upper part of the 'lower body' as shown in image31a. Get out of 'edit mode' completely and add a plane [Add |Mesh |plane], position it near the side bottom of the robot body, watch image 31b for reference. press [F9] for editing buttons and enable 'SubSurf' button. The mesh will turn roundish.



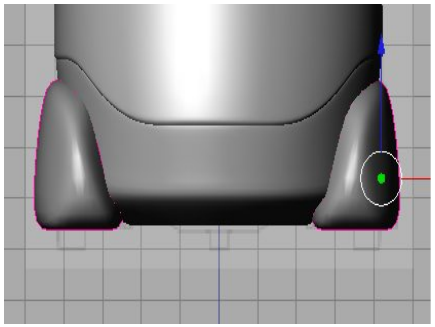
Step 7. Keep the view in 'side view' [NumPad 3] Extrude the side of plane(two vertices) two times and move the vertices to look like as in the image 32.



Step 8. Change the view to 'front view' [NumPad 1]. and extrude the plane three times outwards (red axis). and manipulate the vertices to as they look in the image33a image33b.Now get out of the 'edit mode' and as soon as you get out of the edit mode you might see a black line in the middle of the head mesh as seen in image 23b. Again get in to 'edit mode' select all vertices and press [Ctrl + N] (calculate normals). Now the mesh will look smooth and you have created the head of the robot.

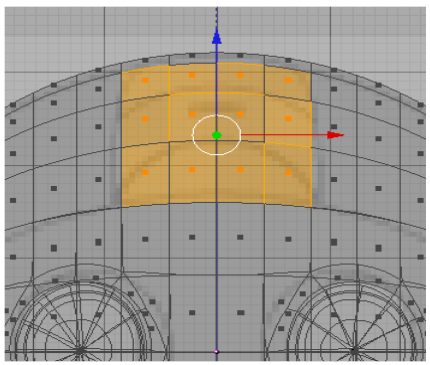


Step 9. After the robot 'shoe' has been done select all the vertices of the show and issue [Shift +D] move the selection to other side of the robot and after position it mirror [M] it in X axis. See image 34.

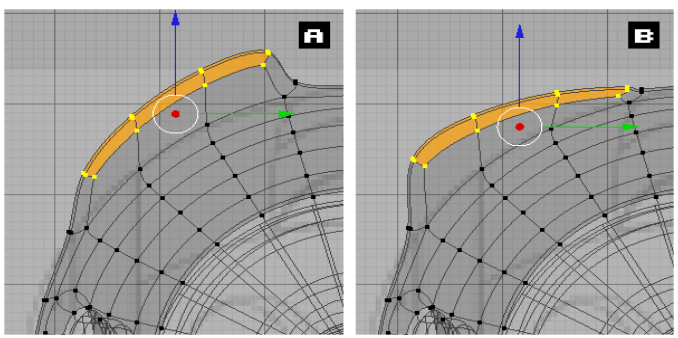


PART-4 LEFT OVER DETAILS

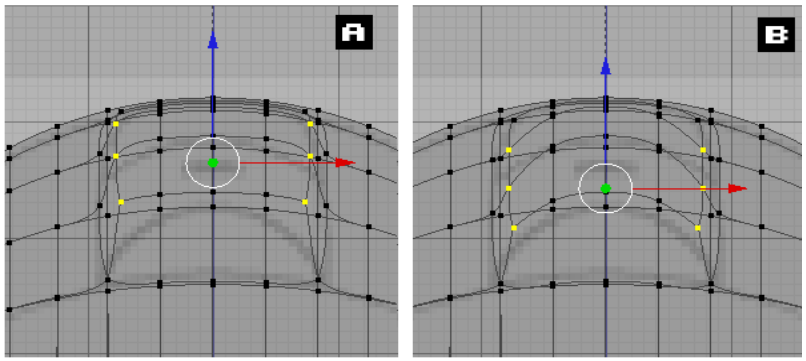
Step 10. *Changing the selection modes:* The basic model is just about complete, we forgot to add the little bump in the middle of head. Now select the head mesh and get into 'edit mode' Now we need to use the selection method as face as it will provide for easier selection. Press [Ctrl + Tab] and in the popup select the 'face selection' the view will change a bit as shown in the image. Now you can start selection the faces by right clicking on them, here you will need a group of faces to be selected so keep pressed the [Shift] key.



Step 11. *Extruding faces:* Change the view to side. Extrude the faces upwards(blue axis) once. Now we need to rotate the selected faces only on x axis so we will press [R] and immediately press [X] and move mouse to rotate. Rotate the selected faces so that they look like as in the image.

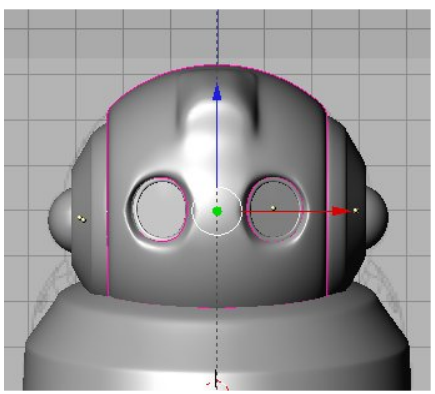


Step 12. Change view to front. Now change the selection mode[Ctrl +Tab] to vertices. And select the side vertices (three each side) as shown in image37a. Following the background image in the view-port move them down (z axis).



There are various smaller details left for the robot, they are left as an exercise for the reader. You can use use the methods provided here to create them, like the speakers in the front part of body and the tires of the robot. Make sure to read the other tutorial on texturing the robot in the learning section.

See the outcome of it in the 'shaded' [Z] mode.



This wraps up the modeling tutorial have fun blending !

Gaurav Nawani

Using Blender Mechanical Gears - Script

By Stefano Selleri

Abstract: This article deals with the modeling and animation of gears, providing a short tutorial for the utilization of the Blender Mechanical Gears (BMG) script.

Introduction

One of the key points in modeling and animate mechanical devices relies in the need to produce gears. Gears are not merely “wheels with teeth”. Gears were like that in ancient days, but modern mechanics deeply studied the different ways in which spin can be transferred from one rotating axis to another, defining exactly how a gear must be designed for maximum efficiency.

Some theory can be obtained from the docs on [1] (I don’t want to promote any particular gear manufacturer, but this is the reference I used to create my gears) as well as in the Blender Mechanical Gears (BMG) script documentation [2]. Basically a gear must be designed so that no friction occurs at two meshing gear teeth. This ensures efficiency, long duration, and low noise. The mathematical description of a gear is based on the involute concept. The involute of a circle has several properties; the most important of which is that teeth of meshing gears whose profile is an involute do not slide one on the other while the gears rotate, and the pressure angle with which a gear pushes the other stay constant.

I will not go deeper on this here; you don’t need to know, since the BMG will handle mathematics, but if you are curious just browse [1,2].

The Script

BMG is a script suite you can download from [3]. It comprehends two scripts, a mesher (BMGm) and a spinner (BMGs) we will concentrate on the former first. BMGm belongs to the Mesh category if you elect to install it in the proper position within the .blender tree. In any case, once launched, it presents a screen as shown in Fig. 1

BMGm can create Cylindrical and Conical gears... the worm option is not working, yet ;). In this article we will concentrate on cylindrical to demonstrate script usage.

Main Gear Parameters

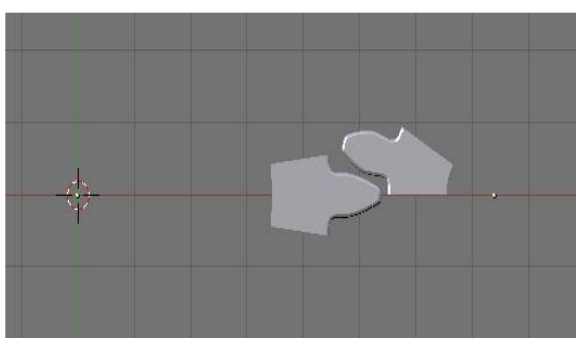
This group of parameters defines the basic look of the gear. When two meshing gears are set what defines the geometry is the Pitch Radius, which is the radius of the ideal circle on which the meshing teeth of the two gears touch. It is the pitch radius the one defining most of the gear geometry. This, as most over entries, is defined in Blender Units. We will keep the default 5 for now. The teeth number defines how many teeth the gear has. This is the second most important parameter, and we will set this to 25 for this example. The Pressure angle is vital, from a mechanical point of view, but is of less importance in computer graphics. It defines the angle between the tangent plane to the gear tooth at the contact point and the plane containing the two gears rotation axis. It is probably better to leave this to the default 20° value. Helical Angle defines helical gears shape. Common gears have straight teeth. Helical gears have slanted teeth. Helical gear are less noisy and more swift in operation, and more costly to manufacture, all things you don’t care in 3D graphics, so we will keep this angle to 0 now.

The Addendum and Dedendum defines how far beyond and beneath the pitch radius the teeth extends. These parameters are critical. First the Addendum cannot be greater than the dedendum, or you will have big meshing problems. Second, Their value must be tuned according to the number of teeth. The more the teeth, the smaller these two must be, the fewer the teeth, the larger they can be. For our example 25 is an average teeth number, so we can keep them to the default 0.4 value.

Beveling:
No true mechanical devices have sharp edges. Fillet defines the radius of the rounding at the top and bottom of the tooth. Bevel defines the beveling of all edges on upper and lower face of the gear.

Mesh Parameters:
The script generates a single tooth for the gear, with a given refinement level in the mesh. The refinement level is given as a Resolution along the tooth perimeter, which should be kept to 2 unless you are planning to zoom in a lot (rise it) or zoom out a lot (lower it) on your gears and a Longitudinal Resolution along the tooth thickness. This is actually needed only for helical gears, which do exhibit longitudinal twist. Finally the Thickness defines how thick is the gear and the Width defines how much to the inside, with respect to the pitch circle, the body of the gear extends beyond the tooth. Keep all these to their defaults

Pinion:
There is no point in defining a gear without is matching pinion. The pinion can be either a standard pinion (a gear) a rack (a straight toothed item) a crown (a big gear with teeth on the inside) let's keep the Pinion option and maintain the 12 teeth.

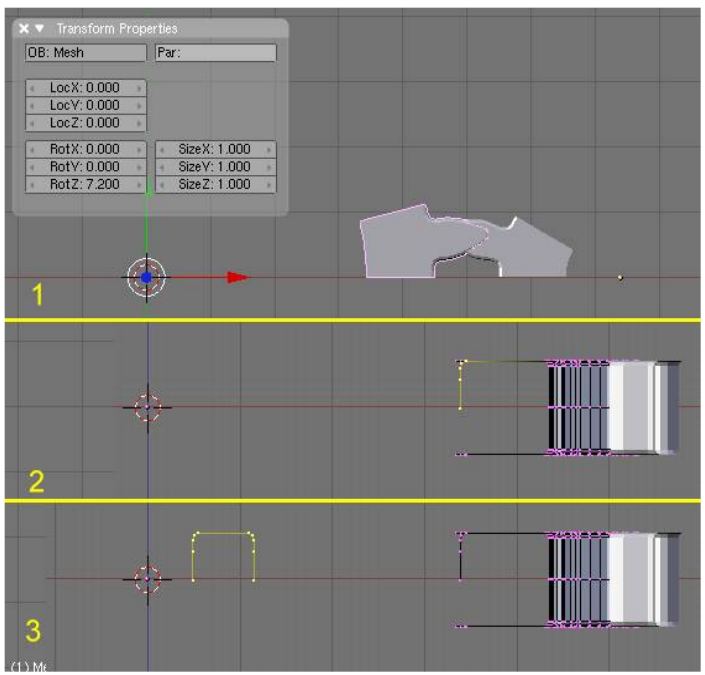


If now you press the Generate button you will see the scene in Fig. 2

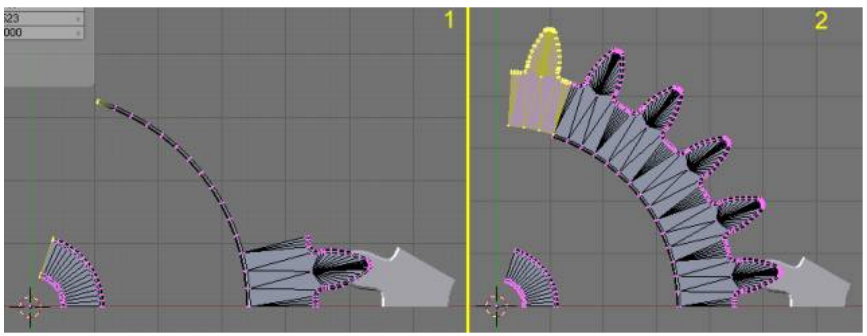
Please note that the script generated a single tooth both for the main gear and the pinion. The main gear object center is in the origin, the pitch radius is 5 blender units, you can see this since the teeth would touch there, once rotated. The pinion radius has been automatically computed by the script, its center is in the right position for correct meshing (rightmost yellow dot) and the tooth has been produced slightly rotated for the sake of clarity.

Our next task will be to complete the gear and the pinion mesh.

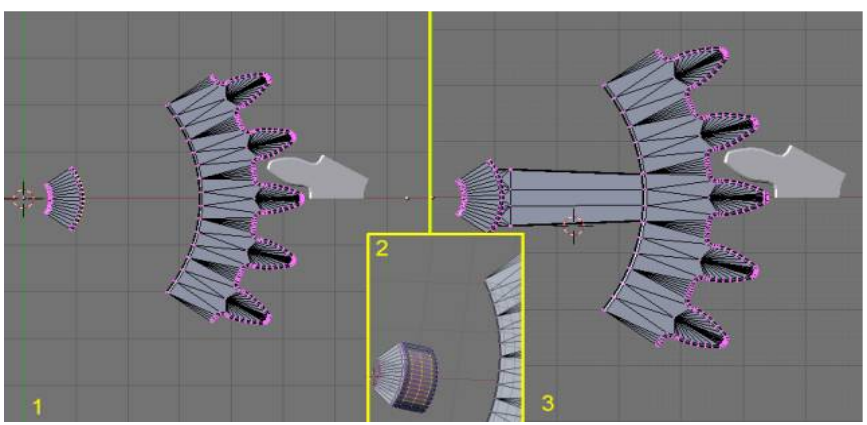
Gear Meshes touch-ups
First of all, rotate the main gear tooth 1/50 of 360° (7.5°) (Fig. 3.1). This makes lower edge of the tooth aligned on the xz plane. In front view and edit mode we can extrude the top vertex to complete the profile (Fig. 3.2). Duplicating this and moving it around on the xz plane will make the profile for the inner gear part too (Fig. 3.3). Now duplicate all these new vertices and mirror them along global z with respect to cursor.



Now go back in top view with all these new vertices selected. Ideally we should spin (counterclockwise) three copies in a 14.4° angle. Sadly Blender does not accept decimals here! So we will spin them 15 copies along a 72° angle. (Fig. 4.1). Now Select the tooth, and SpinDup it by 5 times by 72°. You will have an extra copy of it (Fig. 4.2), which you should delete. Now remove doubles.



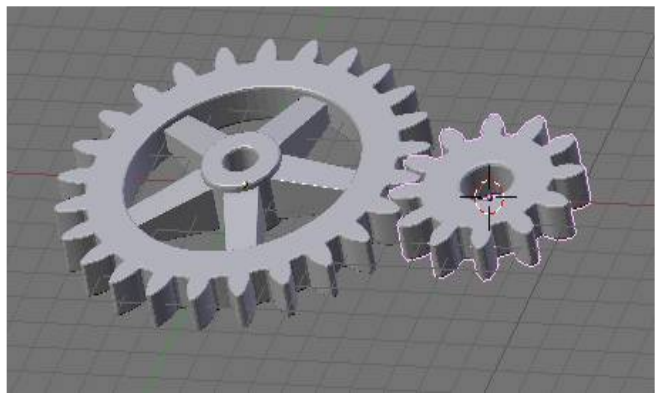
Rotate the gear 36° clockwise, to have it symmetrically placed with respect to the xz plane. Now extrude some vertices from the inner part (Fig. 5.1 and 5.2) and extrude it towards the outer ring, merge some vertices where needed. It is also a good idea to use the Bevel script to make this arm nicer.



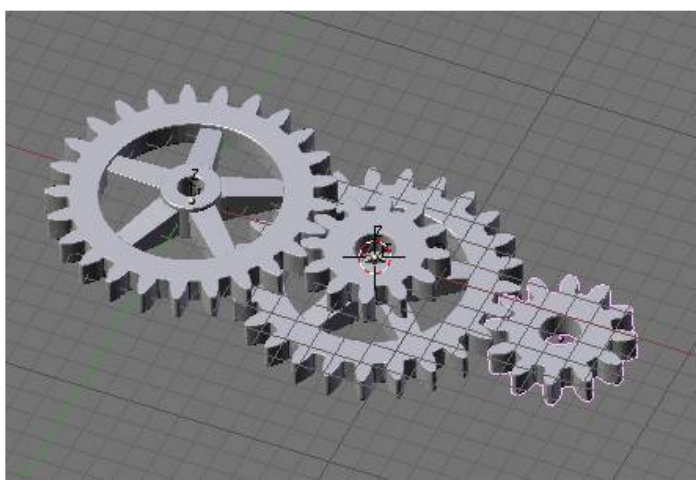
Now you only have to SpinDup on 288° 4 copies and remove doubles! You might wish to scale the inner part a little along z only to make the gear less flat. Do something similar with the pinion too.

But you won't have the space to make the mesh so complex. Remember that the pinion has 12 teeth so a tooth is 30° (360°/12) wide. At the end you should have something like Fig. 6. Give to the Gear Object a mnemonic name (Like 'Gear') and to the pinion object a mnemonic name too ('Pinion' is a good choice!)

Preparing for Spinning!

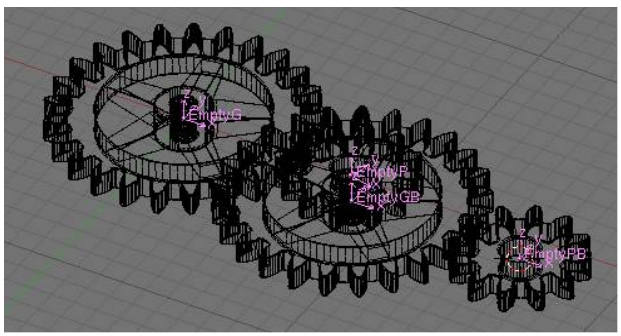


To have the gears spin properly you will need to set up few things, but first, since two gears only is really a sad model, select both gears, duplicate them and move the copies so that the new Gear is coaxial and beneath the original pinion (Fig. 7). Give the duplicates smart names, like 'GearB' and 'PinionB'. Be very careful, the Pinion and the GearB objects must have same x and y location, and an offset on z.



Now add an empty for each gear, located in the gear center, with the z axis pointing in the direction of the gear rotational axis, then parent gears to empties. Give them matching names (Fig. 8).

This is necessary because the spinning script (BMGs) will handle rotations for the gear as relative to the z axis. If the gears are to be moved and are not lying on the xy plane this will results in odd behavior.



By parenting gears to empties and by moving/rotating only the empties from now on – never the gears – the animation will behave properly.

Now launch the BMGs script. It is an 'Animation' class script. It will present quite an empty interface, with just an Add button. Press it four times and four lines will appear. In these line first column

presents a Gear Object name. Fill 'Gear' in the first and 'Pinion' in the second, 'GearB' in the third, 'PinionB' in the fourth. Second column specifies the teeth number. 'Gear' and 'GearB' have 25, 'Pinion' and 'PinionB' have 12. This completes our gears database (Fig. 9.1). The gears database holds info on which objects in your scene is really a gear and should be spinned. You can Save and Load database to/from disk, the script generates XML files. You are advised to do so because the databases will be lost when you quit blender (The automatically generated script for spinning will not be lost!)

Now switch to the 'Link' Panel. Add three lines here with the Add button. The new lines appearing contain information on which gear is connected to which other. The first column in each line contains the driving gear, the second column the driven gear. The third column specify the link type, which can be a mesh kind of link, in which the pinion rotates in the opposite direction with respect to gear and the speed is given by the gear speed modified by the tooth number ratio. For coaxial gears, that is, for gears not meshing but rather mounted on the same axis the link type is fixed because the rotation speed is the same. In rare cases, with crowns and helical gears, the speed might still be in the tooth number ratio but not in the opposite direction. For these cases the InvMesh option exists.

In our example in the first line we will state that 'Gear' is the driver, 'Pinion' is the driven and the link is of 'mesh' type. On the second line 'Pinion' is now the driver, 'GearB' is the driven and the link type is 'fixed' since they are rigidly bound. At last, third line states that 'GearB' is the driver to 'PinionB' in a 'mesh' type link.

The Links database defines a consequential series of actions. If a driver gear is rotated its rotation propagates to its driven pinions and from these to their own driven gears and so on. To facilitate maintenance the two small buttons on the right allows changing links order.

Once the links database is done (Fig 9.2) we are done. You should now press the Generate button. This creates a new script, named DriverSL (Fig. 10). This new script is stored in the .blend file and will not be lost when exiting Blender (You must have saved your file, of course).

```
##########################################################
# This Test buffer is automatically generated by
# BMGs 0.0.3
##########################################################
# Add it as a scene-wise script link

import Blender
from   Blender import *
fn     =  Get('curframe')

Gear = Object.Get('Gear')
Pinion = Object.Get('Pinion')
GearB = Object.Get('GearB')
PinionB = Object.Get('PinionB')

euA = Gear.getEuler()
euB = Pinion.getEuler()
euB[2] = -2.08333333333 * euA[2]
Pinion.setEuler(euB)

euA = Pinion.getEuler()
euB = GearB.getEuler()
euB[2] = 1.0 * euA[2]
GearB.setEuler(euB)

euA = GearB.getEuler()
euB = PinionB.getEuler()
euB[2] = -2.08333333333 * euA[2]
PinionB.setEuler(euB)
```

To complete the set-up go to Script context in the Buttons Window and add a Scene Script link on FrameChanged event. Put DriverSL as linked script (Fig. 11)

Let's Go!

Now we're really there! First make a quick Frame 1 to Frame 2 and back switch. If some gears are not at 0 rotation they will revert to it (In this case our pinions) and you might have to rotate their empties (not the gears themselves!!) to recover a proper mutual meshing between gears.

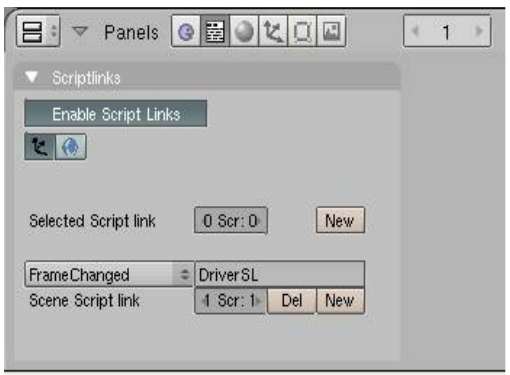


Fig. 11 – Setting the Script Link.

Now select the driving gear, in our example 'Gear'. And add to it a non-constant rotation IPO on RotZ (only on RotZ).

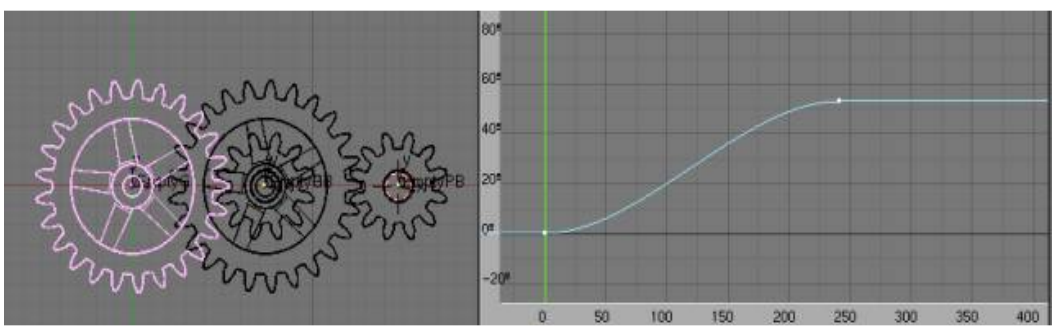


Fig. 11 – Setting the IPO.

Now press ALT-A. The driver Gear will start to rotate, and the Pinion and all other gears will follow with a correct matching velocity!

Conclusions

Webography

[1] http://www.bostongear.com/pdf/gear_theory.pdf
[2] http://projects.blender.org/viewcvs/viewcvs.cgi/bstar/BMG/BMG-0.0.2.pdf?cvsroot=bstar
[3]http://projects.blender.org/viewcvs/viewcvs.cgi/bstar/BMG/?cvsroot=bstar

By Stefano Selleri

Plane-line Intersection

By Alvaro Luna Bautista

1.1. This article deals with the old Plane-line Intersection exercise that every student will find in his Descriptive Geometry practices. Well, everyone knows that the Plane-line Intersection is actually a point (Fig. 1). The process described in this article will help us to find that point: a) calculated with Blender modelling/editing tools; b) no scripts involved; c) with some geometric reasoning behind. The result therefore won't be mathematically exact (we would need to do some maths and coding to achieve that) but quite an aceptable one, a very good approacching and backed by geometric logic.

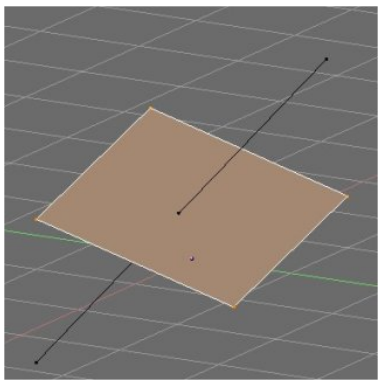
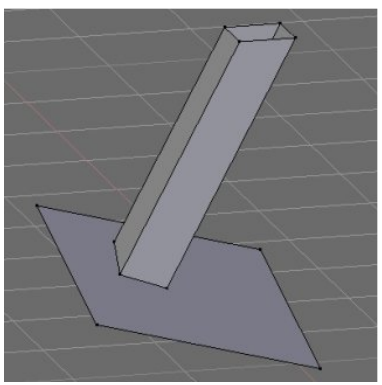


Figure 1. The famous plane-line intersection.



1.2. The main purpose of exercises like that is to bypass current and unpredictable Blender booleans tools. Once we are able to find that plane-line intersection, we can apply this process to a wide range of situations were we need to know which is the intersection between two objects of the scene. In the case below (Fig.2) I've calculated the intersection between the prisma and the plane, using the principles described in the paragraphs below.

Figure 2. An application of this practice.

1.3. The first exercise consists on finding the projection of an object (line) onto another (plane). We'll find that by using consecutively side and front view in orthographic mode. Before starting, lets take a look on the Snap menu (Shift+S keys). On that menu, with the Cursor to Selection option we can place the cursor on a vertice previously selected. Then, if you put your pivot in cursor mode (Period Key), that vertice will be the pivot for scaling and rotating operations. Lets go. We start from a single object in edit mode. That object consist in a plane and a line that intersect one each other(Fig 3).

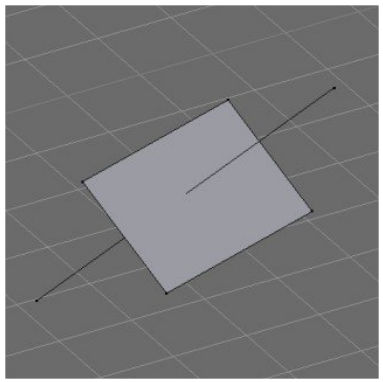


Figure 3. A plane and a line that intersect each other.

1.4. In a ortho side view (3 NumKey) , select an upper vertice of the plane as pivot. Then select the opposite vertice of that edge, duplicate it (Shift+D Key) and scale it (S key) until it coincides with the line. Do the same process with the lower vertices. (Fig.4). Select the two vertices we've created and join them by an edge (F key).

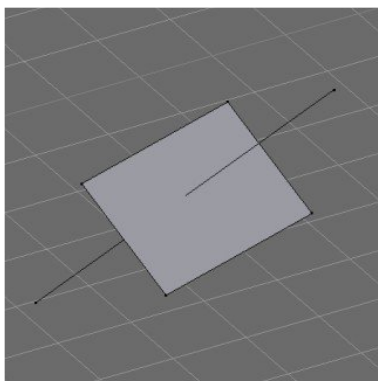


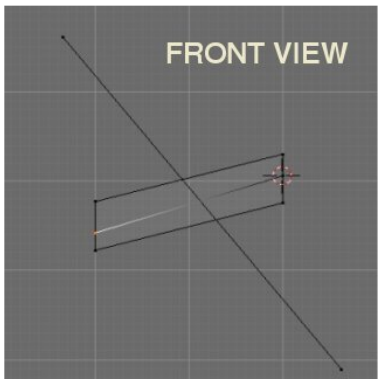
Figure 4. Projecting the line onto the plane.

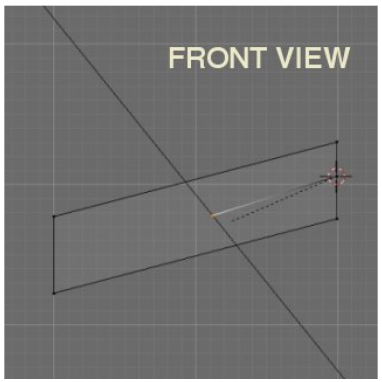
Interesting Links

http://www.hindu.com/thehindu/2001/10/18/stories/08180007.htm
http://en.wikipedia.org/wiki/Descriptive_geometry
http://www.encyclopedia.com/html/d1/descript.asp
http://dg.vidivici.cz/dg/dge.html
http://geometria3d.250free.com/geomtr.htm
http://www.igpm.rwth-aachen.de/~puetz/pub/269.pdf

1.5. Then we change to the orthographic front view (1 NumKey). We select a vertice from the resulting edge as pivot and scale the opposite one until it coincides with the line (Fig.5 i 6). The closer your are to the edges, the more precise the result. And that's it. That point will be the plane-line intersection. You can check the result of the exercise by rotating the view (MMB).

Figure 5. Front view of the resulting line. Figure 6. Scaling the line in the front view.





1.6. We can develop further this kind of geometric reasoning to solve more Descriptive Geometry exercises. In fact, if Blender can help us to solve this simple principle, then It could help us to solve any Descriptive Geometry exercise, even the most difficult ones. The next challenge will be the intersection between two planes (Fig.7). Is that possible?

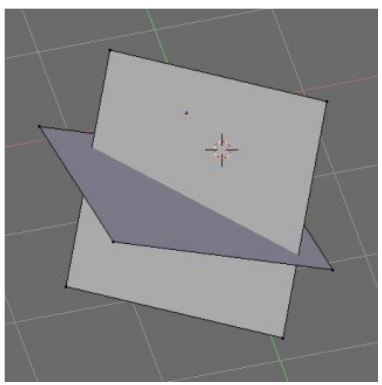


Figure 7. Two planes that intersect one each other.

1.7. We start from a single object in edit mode. That object consist in two planes that intersect one each other (Fig. 7). Then, in a ortho side view (3 NumKey) we project the edges of a plane onto the other as described in paragraph 1.4 (Fig.8). The left vertice of the upper edge is the 1st. pivot for scaling vertices two times, one for the left edge and other for the right one. The same for the 2nd. pivot. We join the vertices we've calculated by edges.

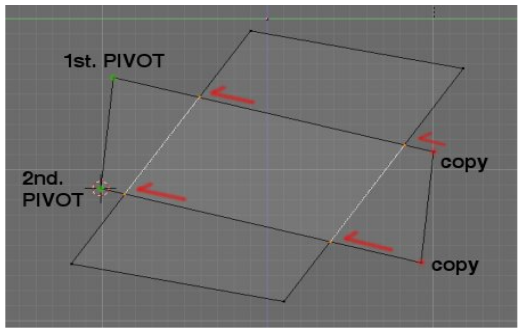
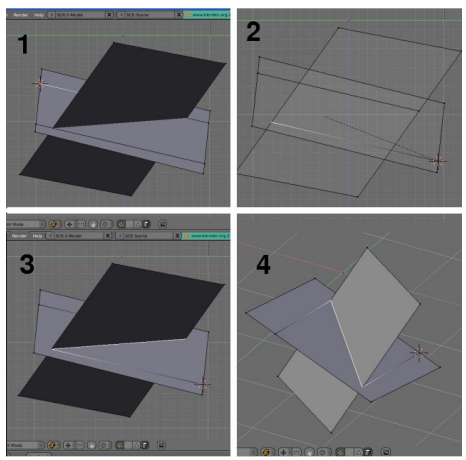


Figure 8. Projections of plane edges onto the other.

1.8. As we see in the sequence below, when we change to the front view, we will probably need to change the vieport shading into solid mode to get a grasp of the situation. Then, scale your resultant lines according with what you see. When your lines have been scaled, join then and that will be the intersection between those planes. You can check your result by rotating the view.



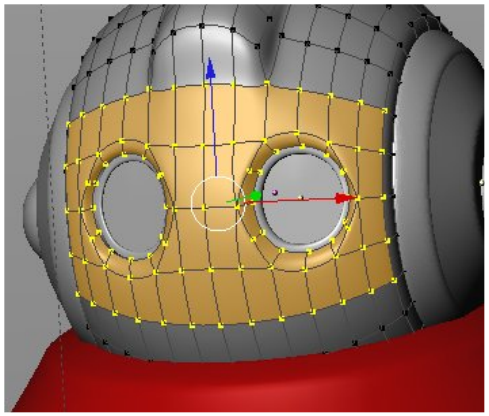
1.9. That's it. This time we've had a bit of fun with Blender by applying old principles of Descriptive Geometry, in fact a couple of hundred years old! A buch of interesting links about Descriptive Geometry:

By Alvaro Luna Bautista
alvarolunab@yahoo.es

Texturing and rendering the robot

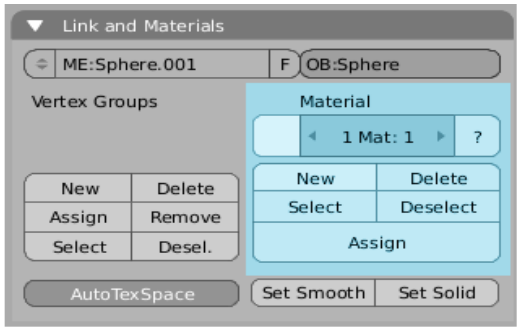
This tutorial will teach you how to add and assign materials to the model. It is basic to intermediate level tutorial. This tutorial is sequel to the robot modeling tutorial published in this issue.

Step 1. Assigining materials to a mesh: To assign a meterial to any mesh you have to first select it. So make sure you are in 'object mode' then select the head mesh. looking at the reference images we can see that the head has two colours, white covering only the front face while orange covering rest of the part. First we will assign a material to the head. Press [F5] to bring up the material buttons. In the 'Material tab' click 'Add New' and rename it to 'Orange'. You now have added a material to the mesh.

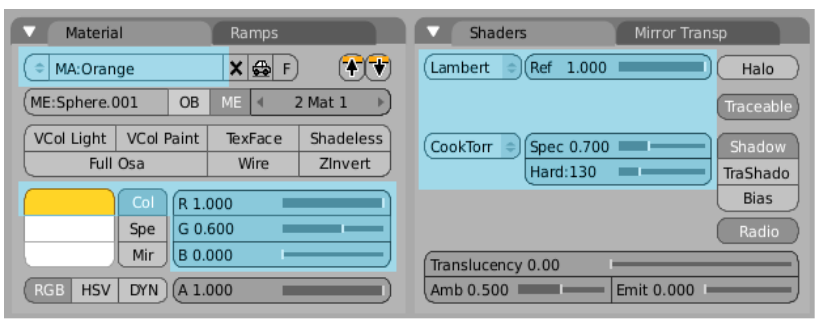


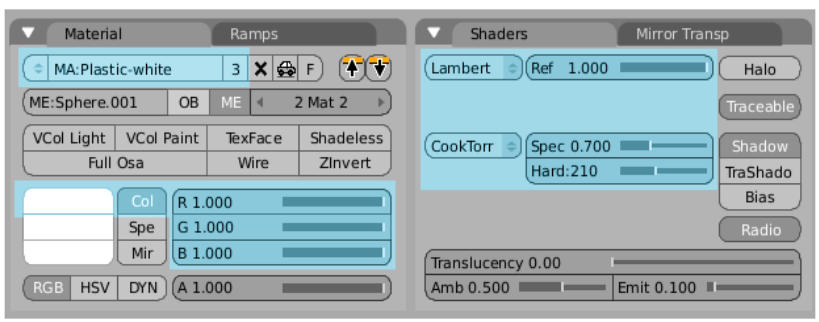
Step 2: Changing the material properties: Now we will change the property of the 'Orange' material so thay it looks like a plastic. First change the 'Col' sliders of R,G,B to 1.000, 0.600, 0.000. This will make the material of orange color.
Now in the 'Shaders' tab change the 'Ref' to 1.000. change 'Spec' to 0.700 and finally 'Hard' to 130. The 'Lambert' shader is actualy a 'diffusion shader' it take cares of how much the surface reflects light. Next 'Cook Torr' is a 'Specular shader' it defines how much shiness a material will have. You can take the image 2 for reference of the 'Orange' texture.

Step 3. Assigining multiple textures to the same mesh: Keep the head mesh selected and get into 'Edit mode' also enable shaded view [Z] now select the vertices as shown in the image1. Now press [F9] and in the 'Link and Materials tab' (Image 3) click the 'New' button this will create another material for the selected vertices. But you must assign the selected vertices for the material first. So now press the 'Assign' button. Now remember the 'Mat' Number for the selected faces.

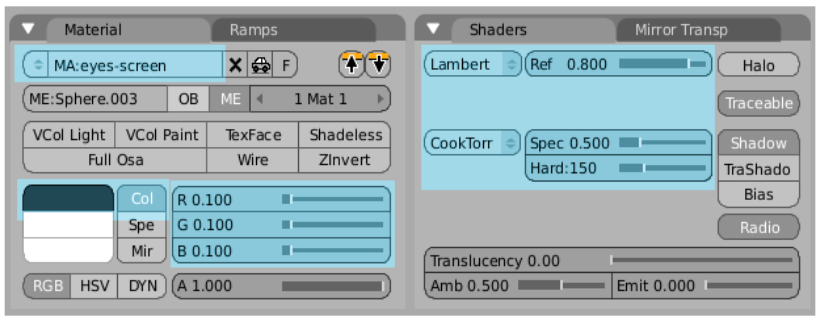


Step 4. Now get out ot the 'edit mode' and press [F5] again to get to the material buttons. Here you will see that the second material assign is the same as was the first. We need a white plastic here so go ahead and click the 'x' in front of the 'Orange' Material. Now again add a new material and rename it to 'Plastic white'. Change the properties of the white material by picking the values from the image 4.





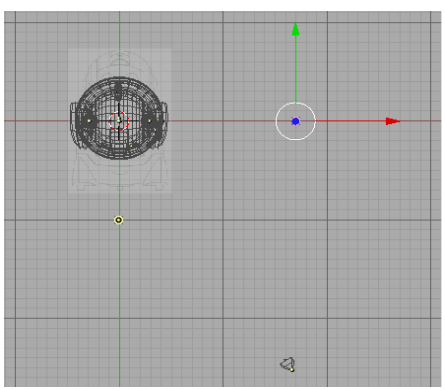
Step 5. Assigining the premade material: Now you know how to assign a new material but what if you want to reuse the same material again. Now as you can see the ear pieces are of the same orange plastic. So to assign them the orange material just select them and in from the material tab select the 'Orange' material. All the material you create are added to the dropdown list.



Similarly assign orange material to other parst where it is needed. Upper and lower body have the same type of plastic material but only the colour is red. So create a new material for it called 'red plastic' and assign it to them

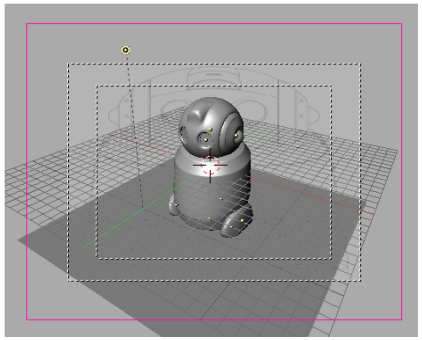
For the 'eye piece' and the 'eye glass' assign the following material. For the shoes you can assign the 'White plastic' material the same way.

Lightening and rendering the scene.

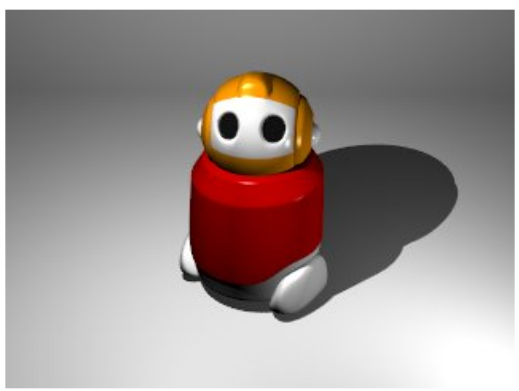


Step 6. Adding a lamp: After assigning materials change the 'viewport view' to top [numpad 7]. Zoom out a little and add ([Spacebar] 'Add |lamp |lamp') a new light in to the scene. Move it to the right as shown in the image8.

Step 7. Using a Camera: Since we have use the default scene we already have one lamp and a camera assigned. Now we will position the camera. To get in to the camera view press [Numpad 0]. Here you can see three frames first one is the 'capture frame' second one is the 'safe frame' the third one is actualy the camera itself. Right click the out most frame and press [G] grab now if you move your mouse you can see the camera moves. Try to position the camera as seen in the image 7.



Step 8. Now its time to render the scene. To render the scene go to 'Render' menu and select 'Render settings' or just press [F10]. Here enable the 'Shadows' button and also enable the 'OSA' button. Now to render the scene just press 'F12'. You can see the render like image 8. Also dont forget to add a 'plane' below the robot and stretch it so that it looks like the floor in the image8.



That wraps up the 'Texturing and rendering the robot' tutorial Have fun blending!
Gaurav Nawani

Let's Get this Robo Moving

This tutorial assumes you have already modeled your robo, Papero. I have done a few preliminary tasks to make this tutorial easier to follow;
I assigned basic materials to the separate parts so that they are easier to distinguish (if you have already followed the texturing tutorial, that is fine)
I have also turned off subsurf for now (makes it easier to see what you are doing). (fig 1)

With simple characters, such as our robo, you don't need a lot of complicated movements. In fact you could probably get away with just using simple keyframing of his head moving from side to side, and adding additional keyframes as he changes location. But then this would be a very short tutorial, and rather unnecessary as you could figure that out all by yourself.

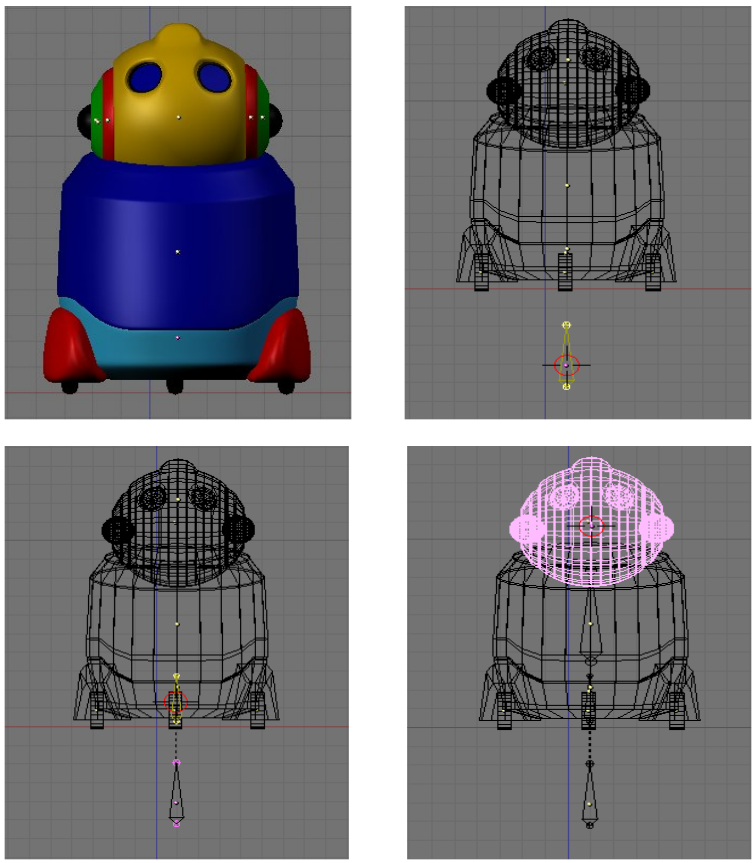
The fact that Gaurav modeled Papero's head as all separate parts, presents us with an interesting option for giving our robo an interesting action set. We are going to animate the ear rings and ear ball shooting out from the side of his head as he rolls along. We are going to accomplish this by using Action Constraints.

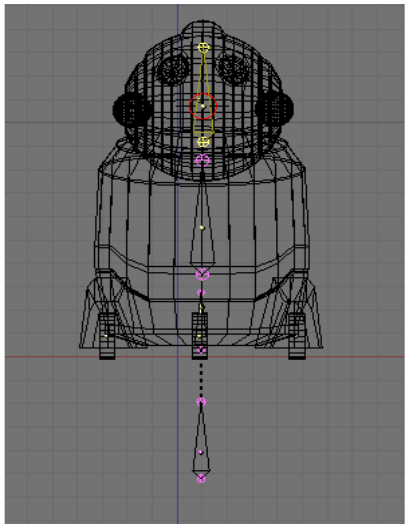
The basic premise of Action Constraints is simple. You create a set of actions once, then attach that set of actions to one bone with an Action Constraint. When you rotate the one bone, the set of actions gets triggered. Pretty slick time saver, it also assures that the action will be consistent throughout your animation.

This tutorial was created with Blender 2.40 alpha-2. (If you have a previous and or possibly newer version, this should not be a big problem as Action Constraints have been around for quite a awhile.)

So let's get started.
Step 1. We need a basic armature. There will be no IK chains or anything fancy.
Place your cursor below the robo. Press spacebar |Add |Armature. This will be the 'Root bone' and will be used to move the entire robo. (fig 2)

Next place your cursor at the bottom section of the robo, about even with the wheels.
Spacebar |Add |Bone. This will be the 'Wheel Base bone', and will be parented to the Root bone. (fig. 3)
Next place your in the main body section, Spacebar |Add |Bone, this will be the 'Body bone', and will be parented to the 'Root bone'.
[Tab] out Edit mode and RMB on the robo head, in the Edit'buttons click on the 'Center New' button, [Shift + S] |Cursor |Selection. (fig. 4)





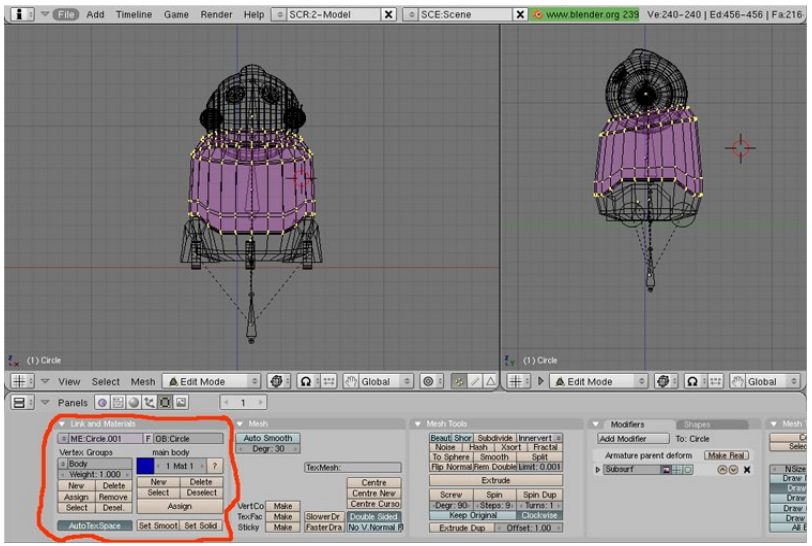
Press [A] key to deselect all, RMB on the Armature and Tab back into 'Edit mode'.
Spacebar |Add |Bone. This will be the Head bone, and will be parented to the Body bone. (fig. 5)
Zoom in on the ear rings, place your cursor in the first ring, Spacebar |Add |Bone. This will be the Ring 1.L bone, and will be parented to the Head bone.

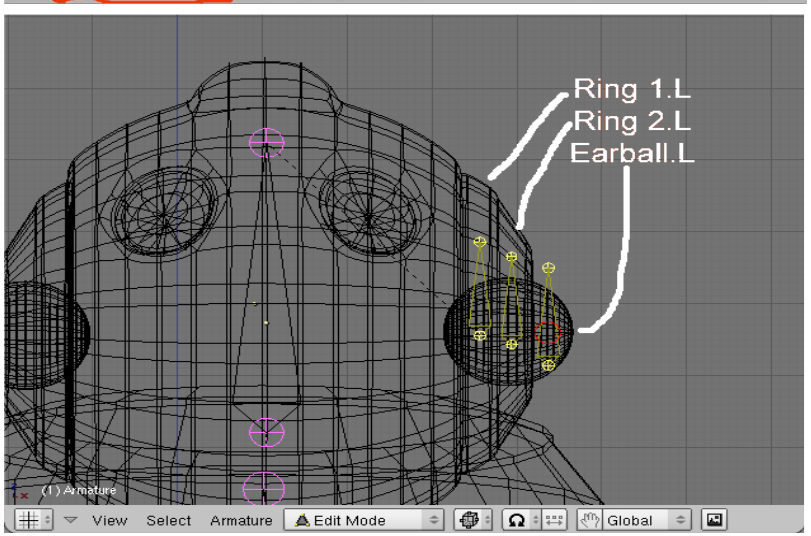
Place your cursor in the second ring, Spacebar |Add |Bone. This will be the Ring 2.L bone, and will be parented to the Head bone.
Place your cursor in the ear ball, Spacebar |Add |Bone. This will be the Earball bone, and will be parented to the Head bone. (fig. 6)
[B] key, drag a box through the ear ring and Earball.L bones, [Shift+D] key to duplicate them, [Ctrl+M] key to mirror them, drag them to the other side of the head and line them up with the ear rings. (Names will be the same, except will end in 'R'.)
This completes your armature.

Step 2: Now we need to parent our robo to the armature.
Tab out of Edit mode, press [A] key to deselect everything.
Select (RMB + Shift key) all the robo pieces, then select the armature
[Ctrl + P] |Armature
Choose 'From Closest Bones'.

Now comes the fun part, double checking to make sure all the parts assigned to the correct bone, no help for it, so let's get to it. The steps will be the same for each part.
Select part, Tab into 'Edit mode', A key to deselect all vertices, look at the 'Vertex Group' panel
Scroll to the correct bone for the part you are checking, click the 'Select' button. If all goes well, the right vertices will turn yellow.(fig. 7)

To assign vertices to 'Vertex Group', select vertices wanted, scroll to desired bone in list, click 'Assign' key
To delete vertices from 'Vertex Group', select vertices wanted, scroll to desired bone in list, click 'Remove' key
Make sure you test your robo in Pose Mode, select each bone and rotate/grab to ensure everything is moving properly. In Edit mode, select all bones and press [Ctrl+ N] to recalculate bone roll (otherwise you might get strange results).





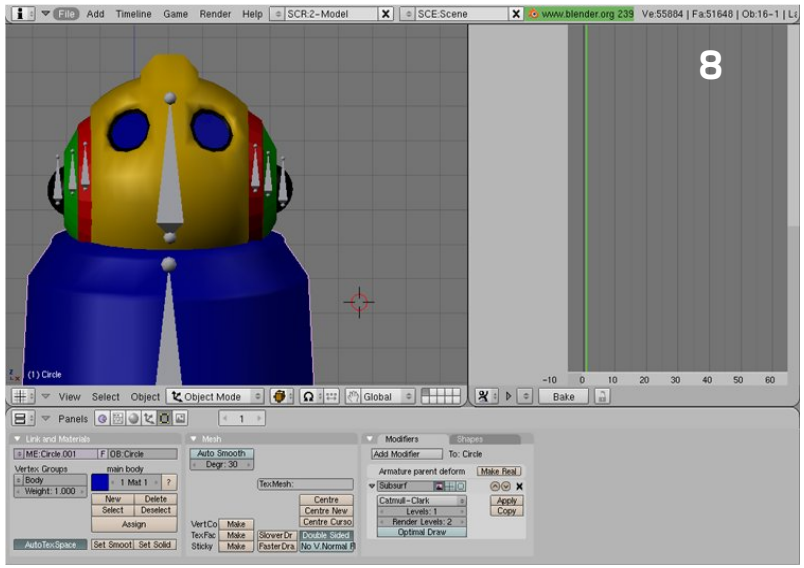
Step 3: Now we can start setting up our actions.
Split your screen into 2, with 3d view on one side and Action Editor Window on the other (fig. 8)
Select the Armature, [Ctrl + Tab] into Pose Mode (Armature bones should be blue/green depending on selection status)

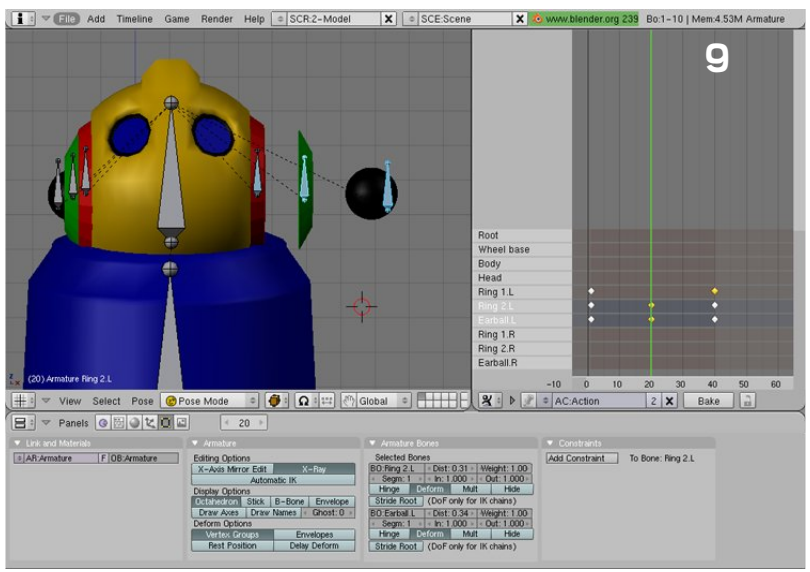
Select the 3 ear bones (Ring 1.L, Ring 2.L & Earball.L), [I] key |LocRot, this will be the base point in the action.
Go forward 40 frames, [I] key |LocRot, this will be the end point in the action.

Go back 20 frames
Select the Earball.L bone, [G] key, while holding down the [Ctrl], move the Earball.L 3 units to the left. [I] key >>LocRot.
Select the Ring 2.L bone, [G key], while holding down the [Ctrl], move the Ring 2.L 1 unit to the left. [I] key >>LocRot. (fig.9)
Go back to frame 1 and test your new action by pressing [Alt + A] keys.

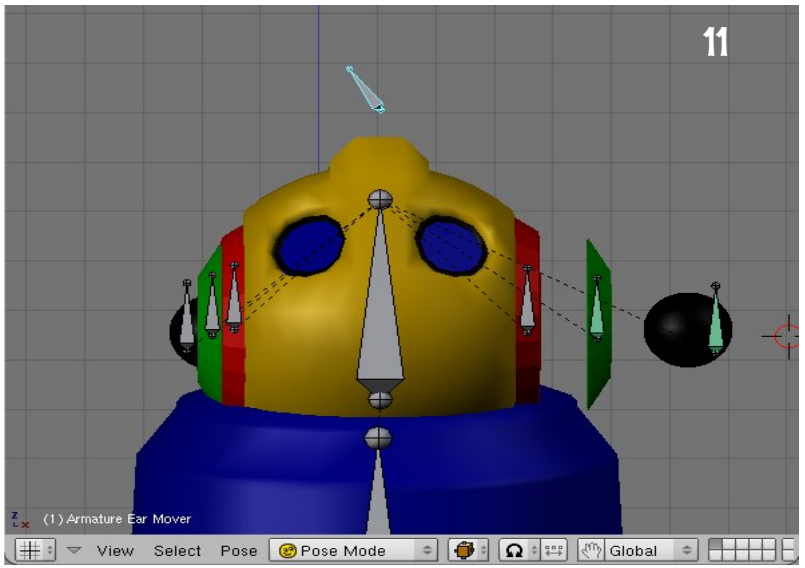
In the Action Editor Window, rename your action something relevant, like 'Ear action', close the action (click the [X] next to the action name)
Add a bone above the head (Spacebar |Add |Bone), name it 'Ear Mover', parent it to the Root bone, so it doesn't get lost when moving the robo around a scene.

Select Ring 2.L bone and add an Action Constraint in the Constraint panel. Fill in the following settings to match the image. (fig. 10)
Repeat the same for Earball.L





Now when you move the Ear Mover bone, the Ring 2.L bone and the Earball.L bone will move through their action. (fig. 11)



At this point you can go back to your Ear action and add in actions for the right side of the robo, so that both sides pop out at the same time. After you have added in the new actions for the right side, don't forget to add action constraints to the right side Ring 2.R and Earball.R bones.

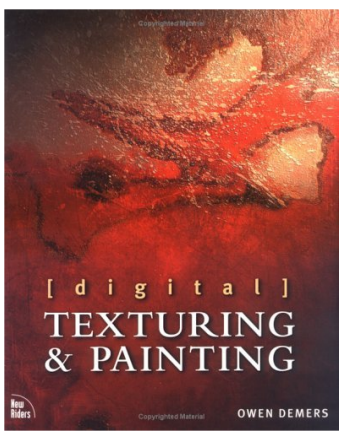
At this point Papero is ready to roll. He can be keyframed to move across the screen, bump into things and show surprise (his ears popping out).

To practice on you own, here are some further suggestions on actions you can add to our little robo Papero to give him a little more character:
Make his head pop up a little off of his body
Make his body pop up a little off of the wheel base
Have Ring 1 and Ring 2 rotate slowly back and forth while he is rolling through scene.
Have the Earball slide ever so slightly in and out of rings
Move Head back and forth sideways as if he is scanning his surroundings.

Have fun with your new little robo.

By Sandra Gilbert

Book in review
Digital texturing & painting



We have all heard it said, hundreds of times, texturing can make or break your model. Unfortunately I can confirm that from personal experience. The best model in the world will just lay there if you don't properly texture it and a lesser, mediocre one stands a better chance of dazzling viewers if the materials and textures are top notch.

In your search for the ultimate, perfect technique on texturing [if you actually find it, be sure to let me know. ;)], you should check out "Digital Texturing & Painting" by Owen Demers.

Owen Demers has written a one of a kind reference that not only gives you a thorough understanding of traditional art theory, but actually shows you how to apply that knowledge to your computer art. Starting with an in-depth look at what actually makes up a texture, he shows how observation and tweaking of texture details can help you create realistic textures.

By answering a series of observational questions, you learn how to dissect textures and then recreate them as needed for any given project. Once you have covered the basics, there is a series of eight complete in-depth tutorials showing his techniques. Each tutorial is filled with fantastic images and step by step instructions on how to achieve great textures.

While no longer the newest book on the market, it is still the most comprehensive reference of texture creation. Accompanying the book is a CD filled with examples and exercise files, making this a must have book on every serious modeler's bookshelf.

Digital Texturing & Painting (Paperback) by Owen Demers

Paperback: 352 pages

Publisher: New Riders Press; Bk &CD-Rom edition (August 9, 2001)

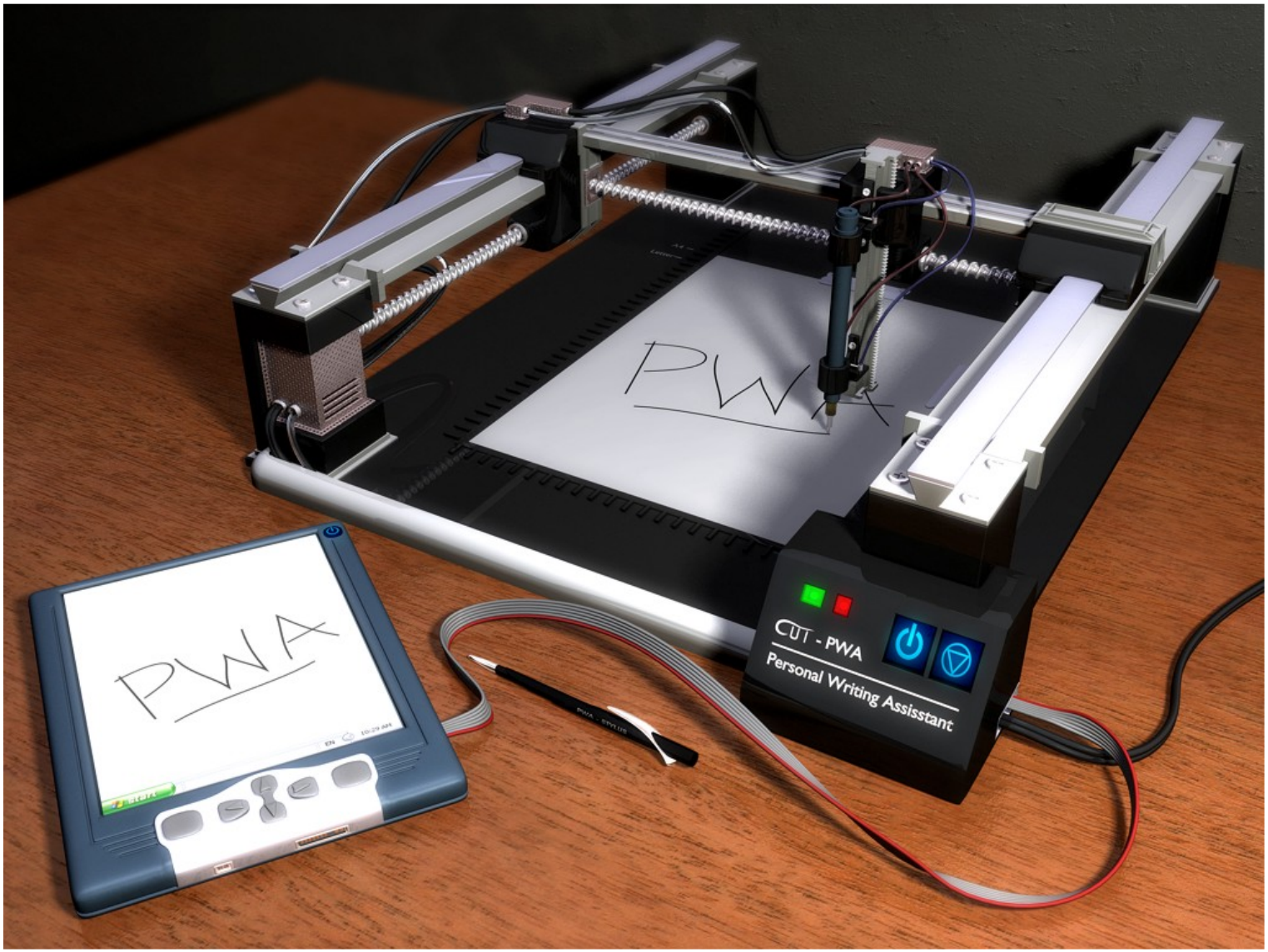
Language: English

ISBN: 0735709181

Product Dimensions: 10.0 x 7.9 x 0.7 inches

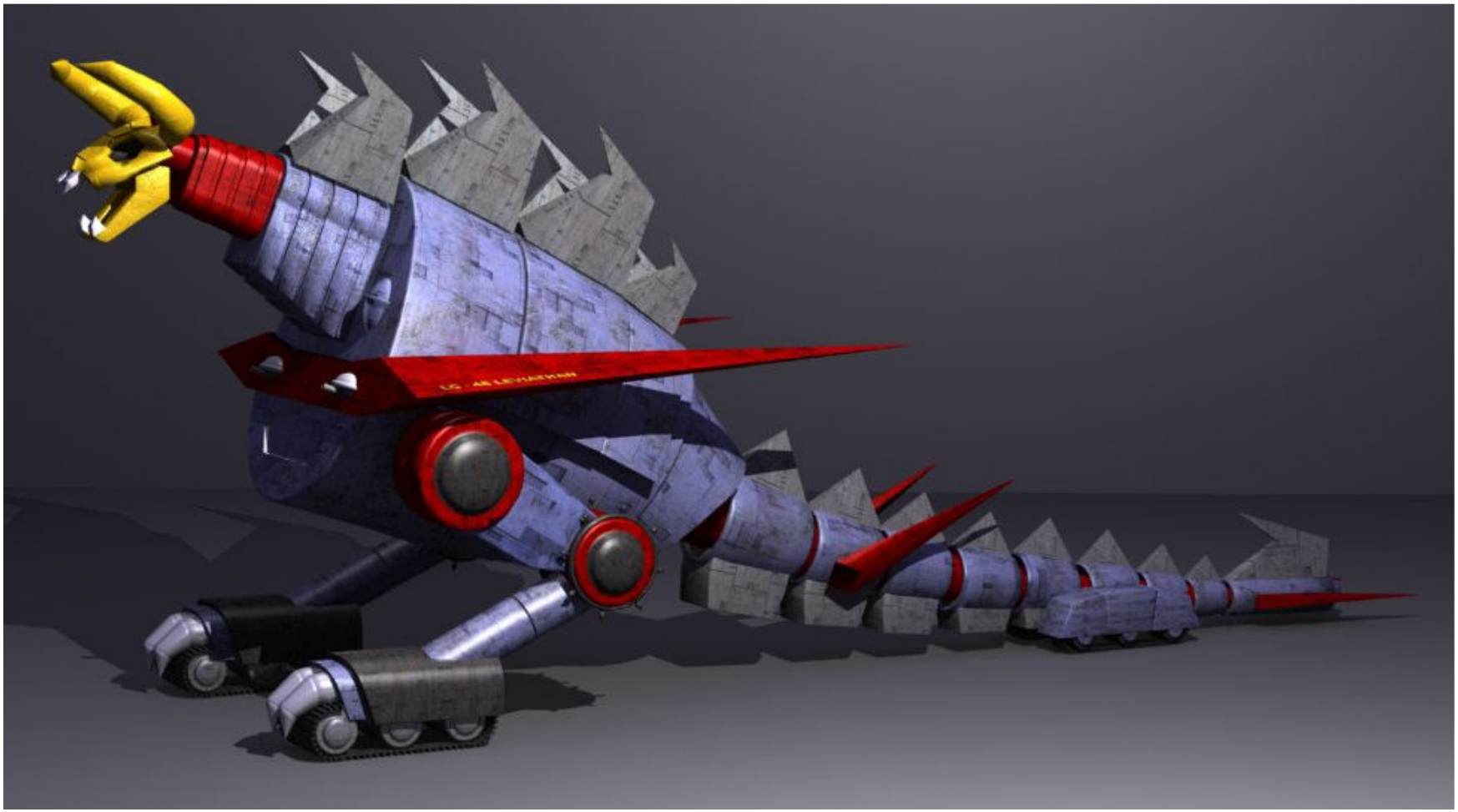
TANK
Carlos Pena Cativo | NY, USA
Inspiration: War I guess...

AGE OF STEAM
Zsolt Stefan | Budapest, Hungary | Student of Industrial Design
Inspiration: I saw a similar machine exhibited in a national "historic park", basically a huge open air museum.



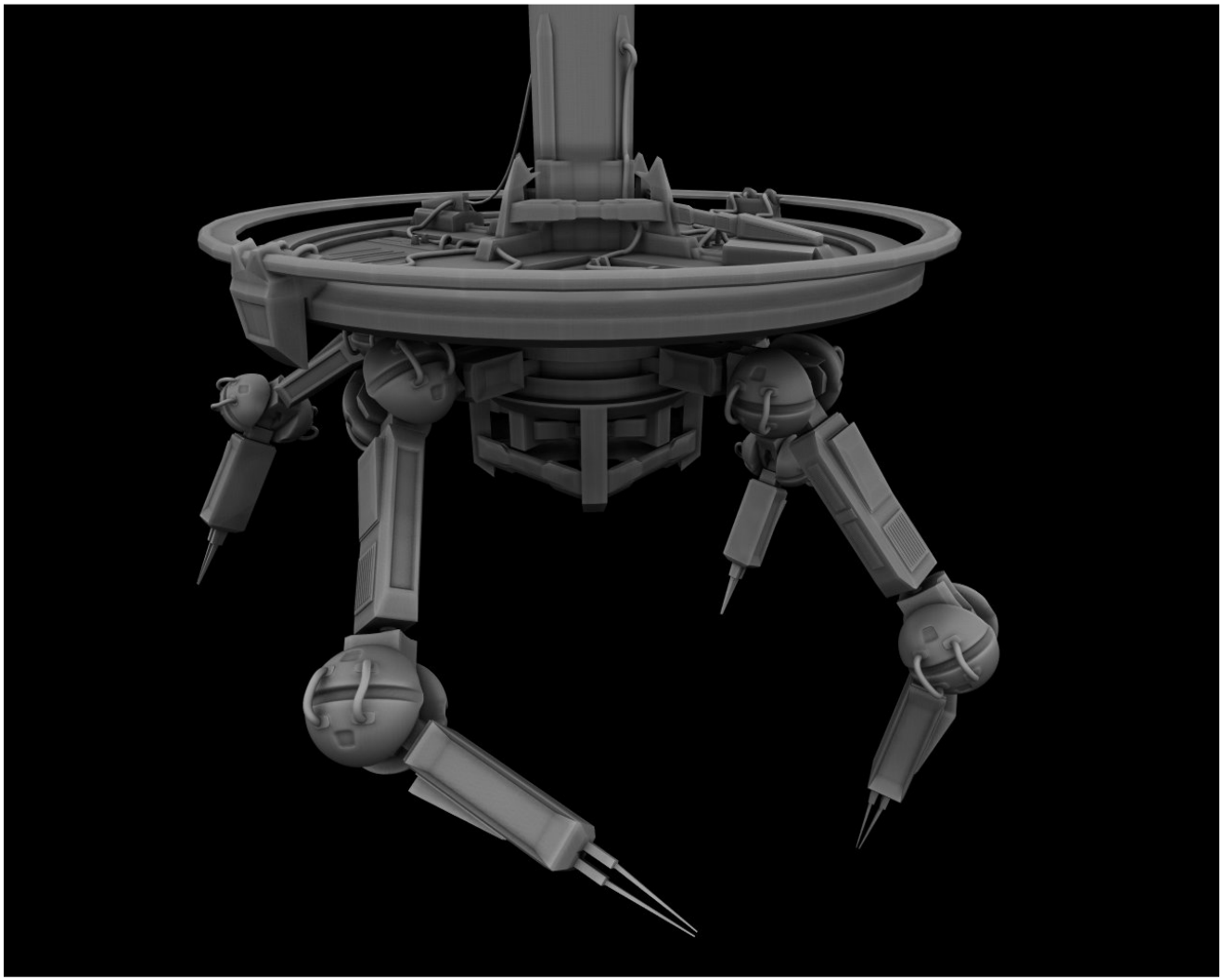
AGE OF STEAM
Zsolt Stefan | Budapest, Hungary | Student of Industrial Design
Inspiration: This was my entry to the first round of the first Blender World Cup, it received the most votes! The topic was "Prototypes you think will never be made".

ANT
Alexander Metz | Karlsruhe, Germany
Inspiration: Inspiration is the classical conflict between nature and technology.



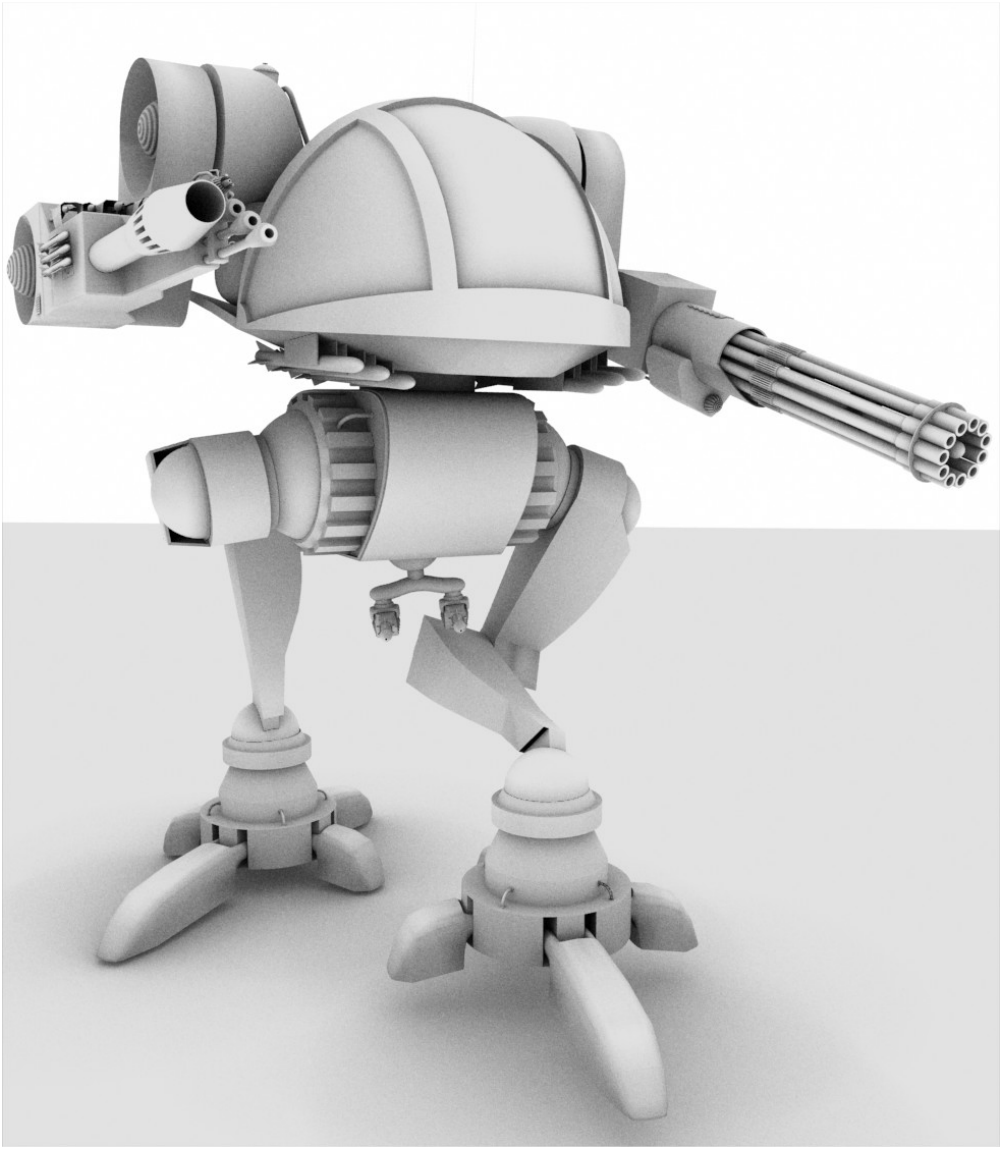
THE DRAGON
Carlos R. Bisquertt | Chile
Inspiration: The Great Space Dragon from "GAIKING" anime

Motorcycle
Michael Thao
Inspiration: I wanted to do something that I was uncomfortable with so I decided on a Honda VTX 1800. I am not a motorcycle or car fanatic, just another computer geek/ graphics artist. I learned alot about my modelling style and modelling in general. I aimed for mechanical authenticity and faked nothing. Hundreds of objects (including individual screws, nuts, and washers) and millions of polygons.



OPERATOR
Don Kim | Potomac, Maryland. USA
Inspiration: The general inspiration came from several places. There are touches of Halo, the Unreal universe, and other science fiction games. These were all originally intended to be assets for a short film that I wanted to make. I decided though that my skills at that point weren't enough to do the story and justice. The basic premise though was a futuristic, sort of post apocalyptic world, and these were objects in a scientific military research installation of some sort.

Roland Hess | Pittsburgh, Pennsylvania, US.
Time Involved: a couple of years ago, so, like six hours a piece?
Inspiration: None.



Mech
Gabriel Beloin | Québec Canada
Inspiration: Mech Warrior 4

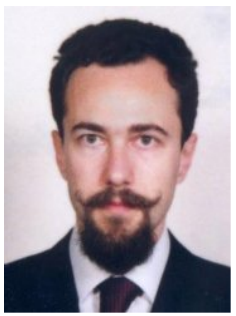
Policarpov I-16
Alvaro

Alvaro Luna Bautista was born in 1972.
He is an Architectural Draftsman and currently resides and works in Spain. His favorite hobbies are reading and blending.

Gaurav Nawani is a graphics artist at IronCode Software.
He is an open source enthuisast and loves writing articles as a freelancer. Apart from his usual habbits of photography and traveling he dabbles with cooking ;)

Hi, my name is Sandra Gilbert, (aka dreamsgate). I have been using blender for a little over five years. I currently live in Nampa, Idaho, USA and work as a graphic designer for a small print shop. I'm married and have 2 children, which leaves not near enough time for feeding my growing blender obsession. Yet somehow I always manage to find the time to explore new features, keep up on the latest news and start new blender projects. Some of them I actually even manage to finish.

Stefano <S68> Selleri, was born in Viareggio (LU), Italy on 1968. He met Blender in 2000, by reading of v. 1.72 on a computer magazine but it was only in 2001 and v. 2.23 that Blender began to eat a lot of his time. He uses Blender mainly for artistic stills (at least he believes so) and, to a lesser extent, for animation. He was awarded the Suzanne Award 2003 for Best Art. He also produces and maintains several scripts, mainly conceived as modeling and animation aid. These can be found in the bstar repository of the central Blender CVS server (cvs.blender.org).
He is also involved in the administration of elYsiun, since 2002 and, since then he is also deeply involved in Blender Foundation, organizing and coordinating Blender documentation board efforts at maintaining Blender documentation, as well as actively writing.



ISSUE 2
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Theme: 'Animation'

Highlights
Articles from the 'Suzane awards winners' about their prize winning entries.
News from project 'Orange'.
Tutorials
Reviews
Gallery